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THE PROJECTED KWANGSI RAILWAY

Physical and General Description of Kwangsi Province

Survey parties are already on the way to look over the country through which the proposed railway through Kwangsi Province is to run. This is an earnest that work will be inaugurated immediately the railway is declared feasible. In order to cover the route quickly and effectively several parties have left to operate in different sections. One party has gone south to make a reconnaissance from Yamchow on the coast to Liuchowfu, on a tributary of the West River; another party will travel up the West river and to Liuchowfu and will make the reconnaissance from there to Kweilin, the capital of the Province. To meet these, two other parties have set out southwards from Hankow. One will take in the country from Chuchow, south-westwards, to Paoking, and another will cover between Paoking and Kweilin.

The following physical and general description of the Province will give an interesting outline of the country which the proposed railway is destined to open up:

Extending from latitude 21° to 26°, and longitude 105° to 112°, the province of Kwangsi comprises, in all, an area of 78,250 sq. miles. From east to west it stretches, at its most, some 400 miles; from north to south its extreme width is some 300. The whole character is mountainous, especially to the north and west; high ranges likewise separate it from Tongking to the south; and from Yunnan to the south-west. But, in a general way, there are few ranges, and merely a succession of individual heights—connected, though with sudden declivities between each.

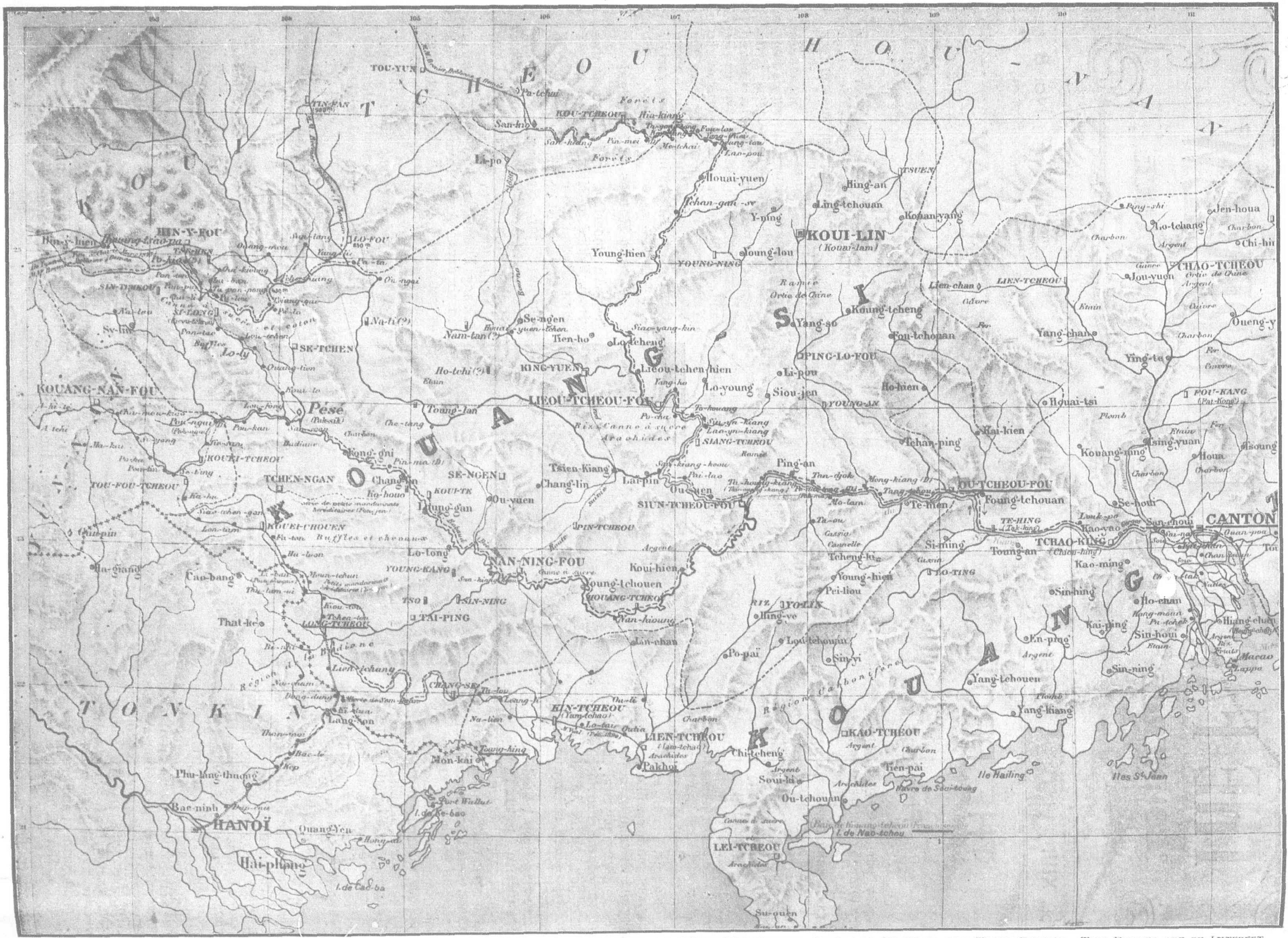
The rivers consist of the trunk river, the West River, and its branches. Of the West River, it is to be observed that it is only known by that name so far as Hsunchowfu, at the junction of the Nanchiang and Peichiang. The former tributary is styled the Yuchiang, with reference to its direction at its junction above Nanning with the Tsochiang similarly so named, and which descends from Lungchow. Upon the Yuchiang lie such towns as Nanning and Kweihsien. The lesser branch of the West River, which passes Nanning and ascends in the Po-se direction, is navigable for large native craft as far as this latter town—some 700 miles from Canton; lesser vessels can reach Pai, 30 miles further; and craft drawing not more than a foot can ascend within the magistracy of Hsilin. Just in the same way as the lesser branch, the greater is navigable for fairly large native craft (say, of 18 tons), so far as Tach'angan, a large centre to the south of Kueiyuan Hsien—sampans can even pass as far as Sanchueh, in Kweichow.

The Cassia River takes its rise within the mountains around Hsinganhsien, and its characteristic is its rapids more especially between Chaop'ing and P'inglo. The Cassia River by means of a canal (navigable only for small craft), is placed in connexion with the Hsinanho, which likewise takes its rise around Hsinganhsien, and, furthermore, is an affluent of the Yangtsze. The Ch'ienchiang joins the West River at T'enghsien, just above this port, and flows in the south-east of this province.

ABORIGINAL WOMEN OF WAN TIEN, KWANGSI

Trade Routes in Kwangsi

An important trade route is that from Pakhoi to Nanhsiang, a mart of consideration 100 miles below Nanning—a way by which passes heavy merchandise for Nanning and North Kwangsi. Another route from Pakhoi is that of a day's journey to Lienchowfu, thence to Chiaochow, Hsiaochiang, Fuwang, and so to Kweihsien, in six days. Again from Lienchow lies a junk route to Wuli, thence by Lingshanhsien to Nanhsiang. Then again lies a way from Pakhoi to Nanning via Yamchow and Hsiaotung, and this route, through mountains, is shorter than that immediately foregoing, and lighter merchandise commonly passes by it. Further, there is a connexion between Yamchow and Pingtang, and by this salt usually passes. From Pingtang merchandise radiates to every quarter, and especially towards the north. Nanning is a natural centre, and via Pinchow, Liuchowfu, and the Yungfuho Kweilin is reached in 12 days. From Nanning, and again via Pinchow, where it divides off, and thence by the Hungshui River and Ch'ingyuan, is a connexion in 15 days or so with Kweichow. By Ch'et'ang, not far from the river just mentioned, and five or six days from Nanning, there is an additional route to Kweichow. Again, there is a connexion between Yamchow, and Kuangnanfu, in Yunnan, via Hsiaotung, the Tsochiang, and the frontier town of Hsiaochenan, in a poverty-stricken area. Yamchow has, moreover, touch with Lungchow in eight or nine days.



Map of Kwangsi Province prepared by French Missionaries to show Character of the Country, Mountain Chains, Principal Products and Trade Routes. The Routes are of Interest

The temperature shows a great range, frequently falling considerably below freezing-point in the winter, for some weeks, and even occasionally in the south, adjacent to Tongking—while upon the mountains separating Kwangsi from Tongking snow is occasionally to be seen. The population of this province is estimated at 9,000,000, the most populous centres being Kweilin, with an estimated population of 120,000; Wuchowfu, with 70,000; Liuchowfu, with 50,000; and Nanningfu, with 100,000. Besides these chief towns, there are also the not unimportant centres of Yulin, Ch'ingyuan, and Kongkao, the last of which may be styled the "Farmyard of Kwangsi."

The Inhabitants

Among races there are three principal classes, indigenous races, the Cantonese, and the Hakkas. The indigenous races bear different names in varying localities. In the south, especially around Taipingfu and Lungchow, are the T'ujen ("Men of the Soil"); in the north-east these same bear the name of Chuangk'ou, and to the west and north-west they are still otherwise known. The T'ujen race resembles the Annamites, and covers two-thirds of the province. The Cantonese are chiefly to the south and south-east; and the Hakkas, who originally inhabited the eastern portion of Kwangtung, are to be found everywhere. There are, further, two other races of whom scanty remnants remain—the Miaotzu and the Yaojen. The Miao are divided into tribes according to the colour of their dress—the Black, White, Blue, Red, the Flowery, those of the colour of the pie, and the Lung Miao. The Black Miao cover the tract to the north and north-west of Kwangsi adjacent to the Kweichow frontier. It is they who exploit the enormous pine forests which cover the mountains in this quarter, and their chief concern is with agriculture.

PINGLO ON THE CASSIA RIVER, KWANGSI

Mineral Wealth

The geological formation around Wuchow, to a layman, appears to be of red sandstone and limestone, ferruginous conglomerate, a formation commonly occurring throughout the province. An expert has said that the surface consists of decomposed marl and granite, and that underneath is chiefly rock of limestone formation. Limestone formation certainly starts half-way up the Cassia River, and a feature of the upper reaches of this stream consists of detached limestone and marble bluffs. From the general point of view, a granite chain divides Kwangsi from Kwangtung. Originating in Tongking, this chain follows its bent to the principal branch of the West River; then, turning in a north-easterly direction, it passes down the stream to Hsunchowfu by the central branch of the main river. That portion of it adjacent to Tongking is known as the "Range of the Hundred Thousand Mountains," by reason of the numerous eminences. According to Captain De Fleurac, the geological formation of the province is parted into two well-defined formations in the vicinity of Nanning—to the west calcareous, and to the east argillaceous.

The minerals chiefly met with are gold, silver, lead, iron, antimony, and coal; and latterly I have heard of platinum. Silver mines have been opened at the following places, among others—T'ip'ingshan, near Kweihsien, and Kueip'inghsien, Hsunchow. Gold is found and worked in two places in this district, namely, Chiuhsingwei and Tungan; it is also known to exist at Ampingssu, and on the borders of this and the neighbouring district of K'aichien, in the Kwangtung province; it is washed on the banks of the Fu River, and at Hop'ing and T'aip'ing, on the banks of the stream which enters the West River at Mengchiang, in the T'enghsien district; it exists in the district of Chaop'ing and in the sub-department of Enyang.

Iron is mined in many places, and especially at Kuanyanghsien. Coal is extracted more especially at Hohsien, Fuch'uanhsien, and Kuanyanghsien—also in the Po-se direction, and very largely indeed in the vicinity of Nanning; a good quality also comes from Yunganchow, three days by creek from Mongkong, 60 miles up river. Tin is mined for around Hochihchow, in the north-west. The tin exported from here chiefly comes from Patpo, on the Hohsien River and in the district of that name. The natives bring it in the form of sand, and it is sold or bartered for provisions, etc., the price working out at about $25 per picul. The smelted product is sold for about Tls. 58 per picul. The metal is nearly pure, being unalloyed, and is given the form of round ingots, about 20 catties by weight each. Sulphide of antimony is found around Nanning and thence to the north-west.

"In the provincial and the local annals it is stated that silver is yielded by the Chiaomu range and the Chienshan range, Ho district; likewise by the Ch'a-hsi range, Li-p'u district. Tin is smelted in three places—Hochow, Fengsheng district, and Fuch'uan district; also in Tungyu and Tungchung, to the north of Linho district. The natives in these places make a livelihood by collecting the fragments of ore, smelting them, and so getting the tin. Tin is usually found in Ho district and Fuch'uan district. The 'Chiao Nan So Chi' states that the metal is a product of the Two Kwang, and that the output of the Ho district takes the first place for quantity. Copper smelting is carried on at Chu-shan, in Ho district.

"There is iron in Tungnanch'engkang and Peich'aokang, in the district of Wu-ling, department of Hochow," say the annals. "The iron produced in Wuchow, when smelted, is quite liquid in character, and resembles 'flowing water.' When used to fabricate vessels or ware of any kind it is as thin as paper, but yet will not break or crack; the ware so made is therefore light, handy, and durable. The blacksmiths throughout Kwangsi discover Wuchow iron in the smelted copper, and combine them by pouring water upon them; the result is a metal compound of great strength—one of the finest materials to be found in the world.

"White lead is found in the north corner of the Fuch'uan district, and at Pot'ukang, in Lungp'ing district. It is found in pits, in the form of a white and greasy soil, and the natives collect it for mercantile purposes. The product is yielded in inexhaustible quantities, and is used by the women of the Two Kwang to whiten their faces.

Gold like Barley Grains

"Native gold is found in the sandy soil of the fields and moors of Tungshan, to the south-west of the province. It is to be found also in caverns; but will be sought for in vain in mines. The natives make a livelihood by digging in the sand, from which the (auriferous) earth naturally separates in grains—some as big as barley, the smaller more like cuttings of barley cakes. These can be smelted down, and possess a light yellow colour. To reach perfect purity, the product needs re-smelting; but by the process 20 or 30 per cent of the metal is lost. After smelting, the metal is styled 'refined gold.'

"Native gold is found in Jung district, Ishan district, Chao-p'ing district, and Teng district, along the banks of rivers, and in hill or mountain caverns. Gold digging is carried on in the streams and valleys of Nanning and Annam. In these places the precious metal is found in most abundance. Yunganchow is divided from Annam by a stream; and geese and ducks and other water birds, flying to the Annam bank, and there feeding, have been known to return to Yungan and on excretion, gold has been found in their dung. No gold is to be found on the Kwang bank of the river. In general, gold other than from mines is found sand-like in the soil—the small grains resembling barley cake; the larger, beans; and the largest, the finger-nails. These varieties all go under the one general name, 'native or crude gold.' In time past the people of Chiangnan presented the King of Chaohan with pieces of gold the size of melon seeds; this was in the same category as the above described. Gold bits the size of a fowl's egg have even been found, and such are styled 'mother of gold'—wealthy, indeed, will be those who secure such!

"Lead, in the form of globules, comes from the Hunghua range, Yenchinglu, the Fenghuang range, and the Shihtzu range—Hsuanhua district. At present only the Lusheng range yields plumbago, which is, however, not fit for smelting and for the manufactures.

"Copper is found in Nanning and Choutung, of the Yuchiang intendancy. The ores may be obtained by digging down several feet deep. The savage races of the south have ever been fond of using copperware or brassware. Tzujantung, or native copper, resembles the lead obtained from stone cuttings, and is found in gorges and mountain rocks. It is sometimes angular, sometimes circular, in appearance; and in colour, it is green or yellow, resembling ordinary copper.

"Malachite is found in the copper-producing areas of the Yuchiang; it adheres to rocks, and is of the nature of stone—hence its name. It may be used for drawing purposes, and also for house decoration. In another form it is brittle, and in bits resembling small pieces of clay—this form is styled nilu; in quality it is the poorest of all as it is the cheapest in price. It is not much used by man. Azurite comes from Hengchow and Yungchow, in Hunan; Shao-chow, in Kwangtung; and Nanning, in Kwangsi. It is a compound of copper, and accumulates in mountain gorges and caves. Its green colour is delightful and most pleasing to the eye."

Agriculture and Timber

While the country in Eastern Kwangsi, as a whole, is rocky and not especially adapted for agriculture, the occasional great plateaux and the numerous valleys and river banks—fertilised by annual immersions and tended with much ingenuity and economy—yield paying crops of rice, wheat, maize, millet, buckwheat, etc., and have earned for Kwangsi the title of "The Granary of Kwangtung." Especially rich are the districts around Kweilin, Yulinchow, Hsunchow, and Kweihsien, The mountain sides are, for the most part, uncultivated, and the forests with which they were once clothed have vanished—resultant in great part on the Taiping Rebellion. Much sugar cane is grown in the basin of the West River. This is "very widely cultivated in Kwangsi, and three kinds of sugar are manufactured—white, brown, and candy. The great centres of export are Po-se, Lungchow, T'ienchow, Nanning and Ch'ingyuan and Liuchow, on the Lung-chiang, the northern branch at Hsunchow." Cotton is grown in the north-west, also sorghum, Sesamum, tobacco, and tea. There are likewise considerable plantations of white nettle and of camellias, from the latter of which an excellent oil is expressed.

Of timber trees may be enumerated especially the pine and the fir—these two in great quantities around Liuchow and P'inglo, and of which some passes from Kweilin via the Cassia River to this port and thence to Canton, and some via Hsunchow up to Nanning where it is sold and transported to Lungchow. The Wild Miao and Yao usually do the felling in the Liuchow area, which, however, I am informed, has been largely cut away, and now timber chiefly comes from Kuchow, on the Kweichow border. Timber is one of the most valuable exports from Kwangsi. Large numbers of rafts pass Wuchow on their way to the Canton province. They are often manned by Miao-tzu, for much of the timber comes from the borderlands of Kwangsi and Kweichow, which are peopled by these aborigines.

Timber felled in Kweichow is floated down the Tuchiang to the city of Yunghsien, where it is made up into rafts; and so on the Lungchiang and Hungshui Rivers, which flow through forest-clad regions. These rafts are made up of barked logs, beams, planks, and firewood of pine but no scientific investigation of these woods has yet been made, and the probability is that the export is not confined to pine. As a matter of fact, camphor wood is also exported from Wuchow. Green Bamboos likewise leave the port in large quantities lashed in bundles to the sides of junks. Besides these just mentioned and merely adding that there are, of course, many kinds of bamboo, allusion must be made to the maple, the ebony, a species of oak, the camphor, the teak, and the mahogany; and among miscellaneous varieties may be mentioned the cotton tree, the aniseed tree, cinnamon tree, and the *Aleurites cordata*—from whence comes wood oil (post).

Natural Dyes

The dye plants of Kwangsi are (1) indigo, probably from Indigofera tinctoria, L., and (2) the dye yam (shu-liang), the so-called 'false gambier,' the tuberous root of Diescorea rhipognoides. Both are very widely grown. The former is exported in a liquid state, in wooden tubs, mostly by junk to the Canton province. Dye-yams are also largely exported, and they are used in this and the Canton province for tanning and dyeing Native and Foreign cottons, grasscloth, and silk that lustrous brown to dark brown and water-proof-looking colour so much affected by the southern Chinese in summer.

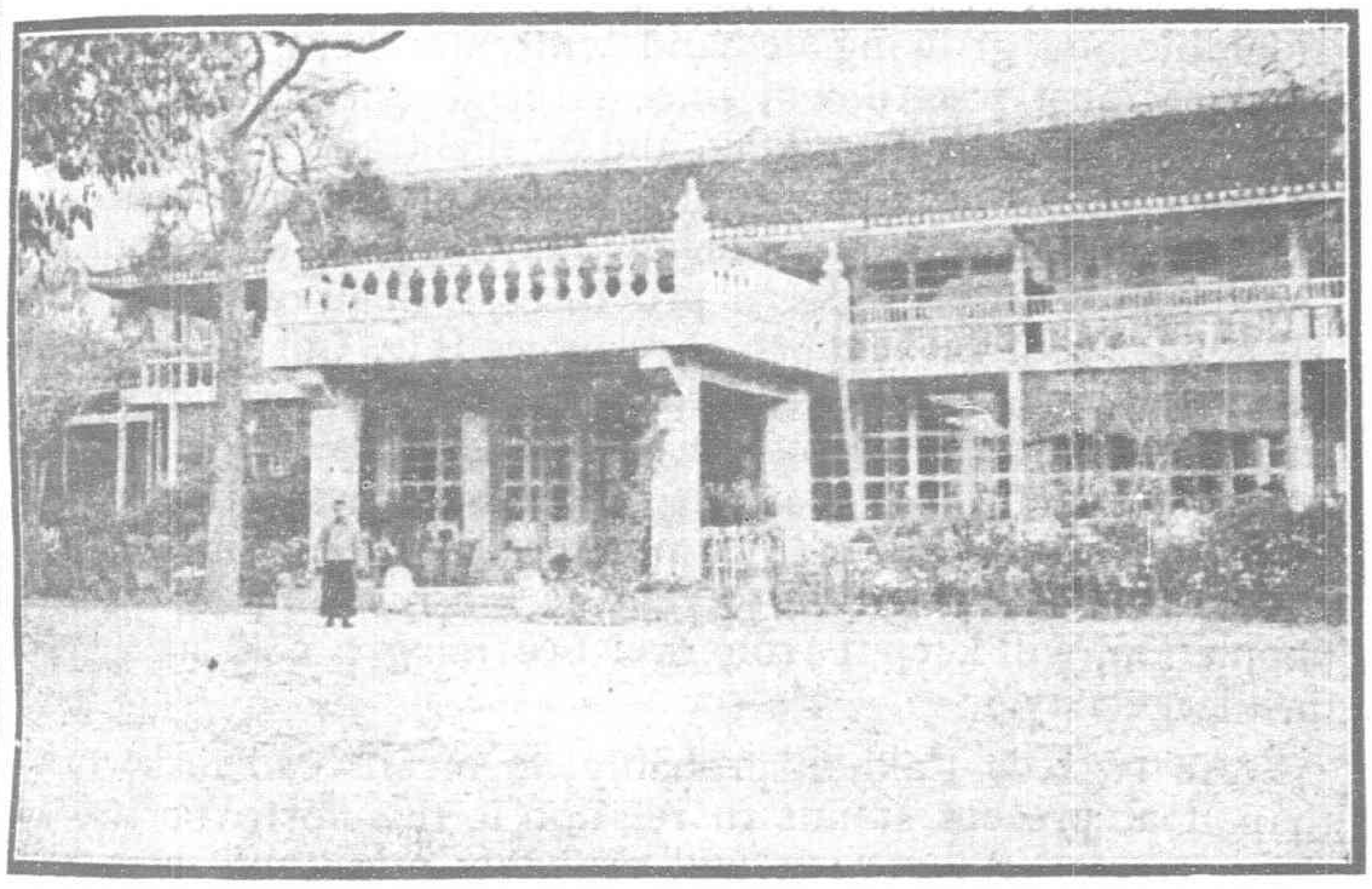
The natural dye is brown, and, if a darker is required, alum or nutgalls are added; and in Canton the juice of green or unripe persimmons is frequently applied as a varnish to the outside of the cloth. That it possesses a waterproofing quality may be gathered from the fact that perspiration does not show upon it, and that to remove dirt only superficial washing is necessary, as the cloth does not absorb the water. The most important fibre-yielding plant grown in Kwangsi is Boehmeria nivea, L., from which rhea (ramie, or China grass) is derived. The chief centre of cultivation lies between Wuchow and Kweilin, the capital of the province. Jute (Corchorus capsularis, L. is also cultivated, but not to the same extent as rhea; it is used for making rope and twine.

It is estimated that from 200 to 300 piculs of catgut are annually manufactured in the Pinglo prefecture, and in the districts of Kuei, Tsenchi, and Jung, and exported principally to Japan to be used for fishing-lines. It is valued at from Tls. 250 to Tls. 260 a picul (133-1/3 lb.). It is made from the liquid secretion of a silkworm which feeds on the leaves of the camphor tree. When the worm is ready to spin its cocoon, it is removed from the tree, cut in two, and steeped in vinegar for a quarter of an hour. By this means the secretion is sufficiently hardened to be drawn out into strings from 3 to 5 feet in length.

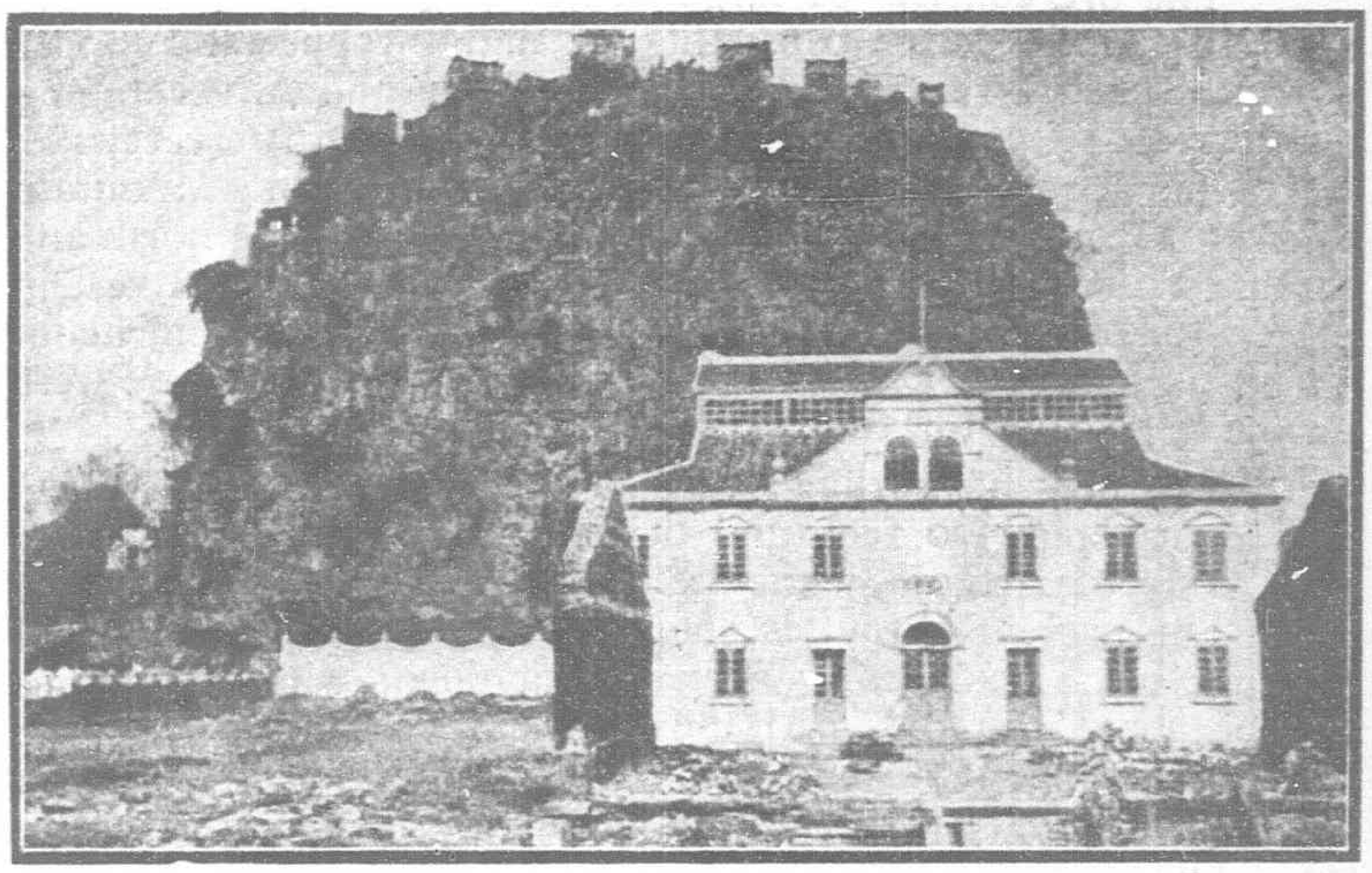
Lizards are very numerous on the hills round Wuchow, and are caught and exported, living and dried, for use in Chinese medicines. Pigs are more abundant than dogs in the streets of Wuchow, and become exceedingly fat. They are sent eastwards in large numbers to the Canton province.

Silk is New Industry

Sericulture is a comparatively new industry in Kwangsi, and while supplies have still to be imported from Canton, the provinces are dotted with mulberry plantations, which become less numerous as Kwangsi is entered. Here the mulberry is not allowed to grow into a tree; the sprout which rise to a height of 3 to 4 feet, and bear fruit, are cut down in November, and fresh sprouts appear in spring and summer. The silkworm eggs are annually brought to Kwangsi from the Shuntak district of Kwangtung. Both white and yellow silk are produced.



THE GREAT MIDDLE SCHOOL, KWEILIN



HALL FOR THE PROVINCIAL ASSEMBLY AT KWEILIN

Deer skins are brought down in thousands from the west of the province and exported. They are of tawny colour, and derived from the mouse-deer. They are used in the manufacture of tobacco pouches and other small articles of daily use, being more durable than the ordinary leather. Tiger skins (tigers abound in the province) are occasionally to be seen in the market.

Star aniseed is called pa-chiok ('eight horns' or 'corners') by the Chinese, from the shape of the fruit, which consists of eight seed-capsules arranged to form a star. The tree *Illicium verum*, which produces this fruit occupies a comparatively small area, being confined, so far as is yet known, to Tongking and the south-west of Kwangsi. Aniseed oil is extracted from amber-coloured seed. It is alleged that, owing to the destructive method of collecting the fruit, there is a good crop only once in three years. Complaints are made that the oil is frequently adulterated with kerosene.

The cassia-producing districts of China are situated in the southern borderlands of Kwangtung and Kwangsi provinces, in the south of the West River. The cassia of commerce is the bark of *Cinnamomum cassia*, but twigs and buds of the tree are also articles of trade. Although a thicker bark is exported under the name of cinnamon, there can be no doubt that it is the bark of old trees. The market town of Tawu, in the Pingnan district, west by south of Wuchow, is the great centre of the trade, where 50,000 to 60,000 piculs are annually disposed of.

Molasses comes down to Wuchow from the sugar-producing centres of Kwangsi, principally from Liuchowfu and Ch'ing-yuan-fu, and is used here and in the Canton province for preserving fruits and vegetables, dates and ginger. Moxa is frequently described as crude camphor, but, although it is a greyish white powder smelling strongly of camphor, it is not derived from Cinnamomum camphora, which is fairly abundant in this province. It is distilled from *Blumea balsamifera*, and the centres of export are Nanning and Po-se. It is a valuable product, costing as much as Tls. 200 a picul, and is used in medicine, perfumery, and in Hongkong it is, I understand, converted into camphor oil. Nutgalls are derived from *Rhus semialata*, and are used in tanning and dyeing. The centres of export are Nanning and Liuchow.

Large Annual Tonnage

The number of Native craft of all classes passing up river annually is said to average 13,200 boats, of which 4,400 contain cargo and 8,800 are empty; the number of Native craft of all classes passing down river annually is said to average 15,600 boats, of which 12,600 contain cargo and 3,000 are empty. The tonnage is hard to compute—perhaps annually it may reach 600,000 tons.

Native banking agencies are divided into the usual two classes, the local banks and the Shansi banks. Local banks are owned and managed mostly by natives of Kwangtung province, and there are here 12 such establishments, of more or less standing. These grant drafts on Hongkong, Canton, and Fatshan; transact various kinds of exchange business; take in money on deposit, etc.; and make advances against cargo and property of every description. The rates of interest for money placed on deposit are by no means uniform, some allow from 8 to 12 per cent per annum.

Railways are to be looked for mainly from the south, and the extension of the Haiphong-Hanoi-Langson line to Dongdang was completed and opened on the 14th July, 1901; surveying was proceeding, with the intention of connecting Yunnanfu with Hanoi and Haiphong. The gauge of the active lines is 1 metre; the track is a single one; there are stations at military posts about every 10 kilometres; and the engine drivers are Annamites. A map of 1898 gives the following lines affecting this part—but the surface of this region is not that of a piece of paper (1) from Tongking up the Red River Valley to Yunnanfu (say 200 miles); (2) Langson-Lungchow-Nanning Railway (length, about 100 miles); (3) from Pakhoi inland, presumably to Nanning (length, say, 120 miles). Likewise must be mentioned the discussed project from Burma to Yunnan. Perhaps it will be of interest to give comparative times by rail at say 30 miles an hour (direct routes), and as by present transit, to certain centres adjacent to Wuchow:—

	By Rail.	*By Present Means.*
Kweilin	6 hours.	18 days.
Kweiyang..	15 hours.	40 days.
Nanning	9 hours.	20 days.
Canton	7 hours.	1½ (by steamer).

The Sancha silver mine, situated in the district town of Kwei, is reached by launch from Wuchow to Kweihsien, thence by sedan chair about 16 miles. It has been exploited by a Chinese company in Hongkong—the Hua Hsing Kung Ssu,—without success. Tls. 200,000 worth of machinery has, it is stated, been imported for the working but, by reason partly of want of funds, and partly of the difficulty of the road, a large number of the heavier appliances have been left in Kweihsien. Starting with a capital of Tls. 600,000, the company lost something like Tls. 400,000. The samples sent to Hongkong for assay produced excellent results, but on working the ore the deposits were unsatisfactory; the shareholders did not therefore see the point of further disbursement. A good deal of money has also been wasted on unsuitable experts. A mining engineer has reported of this mine as follows:—

"The ore consists of large bodies of galena, sulphide ores and copper, the latter consisting of native copper and copper pyrites. Gold is extracted from the silver bullion, averaging about 1 to ½ per cent. The lode is about 5 to 6 feet wide, well defined, and can be traced from the T'aip'ingting Mountain to over 26 miles to the north, the line of reef being north and south. It has been worked on the surface by the Natives, in places, for over 200 years, and chiefly on the high ground about Tingp'ing; on the lower levels, owing to the water, they were unable to get down beyond 60 feet to the ore body.

"The present workings at Sancha, called the Lienfu mine, are down about 320 feet, and the company is still sinking on a good body of rich ore, while the upper levels are being stopped out. The present output is about 10 tons of ore per day, hand hauling; but a main shaft is being put down, when the output will be about 100 tons. All the ore is smelted on the mine, the plant consisting of a blast furnace of 50 tons capacity, 100-ton wasting furnace, 100-ton chloriantion plant, cupellation furnaces, etc. The present management is erecting a concentration plant.

"On account of the ores being of a complex nature, dressing is required; and want of this was one of the causes of the mine not paying—another reason was the presence of large quantities of zinc blende, entailing a great loss of silver in smelting. Besides this mine, there are numerous others which have not been opened, beyond a little surface work by natives.

"Coal, copper, tin, antimony, lead, and plumbago are plentiful in this district, and only want capital and proper mining laws to make them a large source of revenue to the country. The native method of working the ore is very crude. Only sufficient rock is removed to get at the ore; and, in consequence, when they are down into the better class of ore, the air, for want of ventilation, becomes foul and prevents the raising of more ore. The smelting furnaces consist of round clay mounds, about 2 feet in diameter, and holding about 1 picul of ore; and the blast is supplied by wooden bellows.

"The ore is smelted with charcoal, lime being used for flux, and, owing to its not being roasted previous to smelting, the zinc carries off a large percentage of silver. The lead is cupelled for the extraction of silver on beds of ash made from grass and broken fern, and is heated by charcoal, while the blast is supplied by bellows. Here, again, a large percentage of silver is lost—the resulting bullion being about 920 fine. There are hundreds of these furnaces working in the district, and the fumes given off during the process cause a great deal of sickness amongst the natives, owing to the presence of the lead and arsenic."

It remains to add a few words concerning the managemen of the two coal mines at Talingshan, in the district of Fuch'uan and the lead and tin companies. For exploiting the first named two companies were started at Honam, Canton; and the agents of the present company here are two firms—Kuang Sheng Ch'ang and Yuan Heng Li. There is a lead mine in the Kueip'ing district, operated by the Hsing Pao Kungssu, a Chinese company, with offices locally; there has been an issue of 1,000 shares, at $100 each, placed on the market in Canton and locally; the head office is in Canton. At Chienchuling, in the Fuch'uan district, tin mines have been opened by a local company—the Hsing Yuan Kungssu,—while at Niutaoshan a company—the Chung Hsing T'ang—is similarly explciting.

Present Trade Conditions

To recapitulate, the province, as a whole, is both at present productive and possessed of the greatest potential capacity in its mines. It has yet no great cities, nor is it thickly populated, nor is there much outward indication of wealth. Certain artificial obstacles, such as banditti—and natural ones, such as droughts—have been alluded to, and the two are greatly complementary. The trade, however, is rather in posse than in esse, and is at an experimental stage. There is, I believe, a medical dictum that any human organ disused may lapse into inanition; and used, gains vigour. That is the position of trade hereabouts—it is gaining vigour.

Of Wuchow itself, it has been said, in general terms:—As a port of transit Wuchow will take high rank. Imports for a considerable and growing demand will enter here, and up-country produce must pass down, since riverine unrest will alone drive this trade through Tongking, and on this trade Foreign bottoms have as yet little hold. With altered fiscal regulations great changes are expected. Wuchow, as the point of departure for the trade of three western provinces, will draw imports from Hongkong; direct exports are now few, but this must, and inevitably will change. Wuchow is the door through which all merchandise to and from the west must pass—geographically it commands the whole province, and it will always remain a great port of transit, but the mountainous nature of the country all round and up to its very center, thereby seriously cramping a growing population, will keep it from ever becoming a consuming center or a large city.

As regards Pakhoi, probably no means can make it other than it at present stands in relation to this port, Wuchow, save the projected railway; it will probably more and more simply tend to feed that portion of Kwangtung in which it lies. As regards Lungchow, a railway from Tongking might also give it exceptional vitality, though the effect of railways is, no doubt, a difficult problem to juggle with. Mengtsz, via the Red River, already offers an alternative route of importance. In any case, it supplies one province which really lies without the Wuchow sphere—Yunnan; and as regards Kweichow, Wuchow more and more, rather than less and less, supplies it. Mengtsz will grow in ordinary proportion, but will not of itself affect Wuchow. The mart of Nanning might alone seriously affect this port—it will take, perhaps, one-half of both its export and transit trade.

The only difference caused by the opening would be that a certain proportion of duties now paid at Wuchow will then be levied at Nanning. Here, again, the rail is an uncertain factor.

Water versus Railway Traffic

The first Trade Report on Wuchow stated:—"The trade of Wuchow may in future be adversely affected by French railway extension from Tongking. The line to Nanning will no doubt in time become an accomplished fact, and then competition will commence in earnest between the rival routes to that place. It is not certain, however, that the rail will be cheaper than the river. At present, a bale of cotton yarn, for example, can be sent to Nanning from Hongkong via Wuchow for about $7, all duties included; and it remains to be seen if the route via Haiphong will be as cheap. I scarcely think so, considering that there will be between 200 and 300 miles of railway carriage to pay for. The transport will be more rapid; but the Chinese will not care much for this advantage, except they can have that of cheapness also." And while the navigable conditions to Nanning are an obstacle, yet, perhaps, if particular rocks be removed (no very difficult operation) and the channel straightened, probably a special class of lighter, of large carrying capacity, for towing purposes, will be constructed, and cargo go just as well by the West River. With its central position and its easy touch, Nanning—within its own zone—will suffer even less than Wuchow from the competition of either Pakhoi, Lungchow, or Mengtsz.

In sum, then, the trade of the province as a whole will increase, because of its present and latent resources and because of commercial stimulus; the trade through Wuchow, as a natural entry and exit to the province and its neighbours, will grow, first, with the provincial trade on the one hand, and, secondly, so long as Hongkong remains the great centre it now is. But the opening of Nanning will, in any case, affect Wuchow as a depot—still more so if there be navigable through communication with Hongkong; and then conditions would be something like moving Wuchow to Nanning. Artificial routes, such as railways, will, if making carriage cheaper than the natural—and provided (e.g.,) unless and until there be a similar route from Canton to Wuchow,—divert trade elsewhere.

Much depends on what engineering may accomplish in a difficult region—what, for example, may be the effect of improved roads and motor transit; on the other hand, how may water transit be improved and utilised; and here I must recall the well-known words of Mr. Colborne Baber regarding engineering feats such as piercing Mont Cenis tunnels and erecting a few Menai bridges, by which transit in Southwestern China "would, no doubt, be much improved."

A PANTISOCRACY OR WHAT IN CHINA?

The tremendous and unprecedented displays of loyalty and patriotism which are increasingly being manifested by the British in connexion with the pursuance of the great war are causing many thoughtful Chinese to make cold and calculated comparisons between the spontaneously fervid attitude of the British the world over towards their national problems and the frigid demeanour of the Chinese towards China and her internal and external crises. The comparison is unfortunately always unfavorable to the Chinese, and many confess with bitterness that the oft-repeated allegation that there is neither loyalty nor patriotism in China has much to sustain it. A Chinese newspaper, the *Ta Kung Pao*, writing on the phenomenon recently, has perhaps placed its finger on the fundamental cause of the indifference to national problems which characterises the Chinese. In commenting on the proposal of the British to float a colossal loan of £2,000,000,000 the paper asks: "Why are the people of Europe so patriotic and ready to come to the aid of the Government in time of need so magnificently? Are the people of China different from the British?" And it answers its own queries. "The fact is not," it says, "that our people are less patriotic but that the Government is less trustworthy. . If the Government should demonstrate its honesty in using the people's money, we have no doubt but that we would be just as willing to unloose our purse strings to help our country as the British."

Here, indubitably, is the fountain head of all of China's internal difficulties—the untrustworthiness of the Government—though in specifying "the Government" the paper does not merely mean the circumscribed Cabinet which assembles in Peking, but the whole of officialdom, throughout the length and breadth of the country. And why is officialdom regarded as untrustworthy? For the very simple reason that for ages past the mandarin, the petty official, the tax collector, and the vicious yamen runners have regarded every citizen of China as fair game for plunder. Officialdom has been to the Chinese as a huge, slimy octopus whose tentacles have been considered privileged to explore not only the treasure boxes of the rich, but the meagre savings of the working men and the lean coffers of the poor: privileged not by right but because the instruments of might and the powers of persecution, were at its disposal and nefarious deeds were possible because of an absence of easy means of redress such as exist in developed and organized modern States. No where in the world, perhaps, has the inarticulate man with the hoe suffered so much from merciless and vampirish mandarindom as in China. Prior to the organization of the Maritime Customs and the Salt Administration under foreign control there was not a fraction of system in the collection of taxes. The officials battened on each other and on the people, but first, last, and all the time the people paid. From the Viceroy of the Province down to the meanest, dirtiest, foulest coolie who could contrive to invest himself with brief authority as a yamen runner, the right was claimed to a large or small share of the revenues collectable, and it is certain that as much as sixty to seventy-five per cent of the money actually bled from the people stuck to the innumerable hands through which it had to pass on its way to the Treasury. Nor were these expert filchers of the people's wealth compunctious. Where legitimate taxes failed to satisfy their greed, they invented others. Different mandarins devised different methods. No phase of public existence was too insignificant to tax; no sum too small to impose. Money ostensibly extracted for roads and ordinary public services was brazenly misappropriated. The tax-collector demanding dues allegedly for road building would cause punishment to descend upon the one who would dare to point to the bogged mule drowning in the mire before his very door. Development of enterprise was killed. What little industrial work was done struggled along in the face of the cruellest oppression. No factory or mine could exist and show any sort of profit without being in danger of official seizure. The private citizen was taught that it was his duty to yield everything on demand to the officials, and the officials were able to extort money and command silence because the people had nowhere to turn for help or protection. The system of extortion thus became recognised, and only when the very limit of endurance would be reached would a long suffering section of the oppressed populace in this district or that rise and tear the yamen down about the ears of the insatiable official who failed to recognise that forced title to the very grain was not compassible with covetousness of the husks as well.

So accustomed to this system have the Chinese become by centuries of imposition that officialdom stinks in the national nostrils; nor has much been done to improve conditions since some light dawned as a result of the Revolution. There are still rampant in the land officials who claim the right to attach themselves to the public revenue, and every district magistracy is cursed with innumerable runners who still batten upon the people. Even yet Chinese are not free to enter upon enterprises in the country and be protected from official demands for illegitimate spoils. We have particularly in mind in this respect some progressive merchants who desired to establish an oil pressing mill near the Yangtsze, in Kiangsu Province, about one year ago. Likewise some other merchants who had erected a flour mill in the same region. The would-be oil manufacturers were prevented from erecting the mill because they would not pay the squeeze demanded by the local officials, and the flour millers were not permitted to turn their rollers until they had paid a large and extortionate "fee." The oil manufacturers ultimately approached Peking offering to pay a fourth of their profits annually to the officials if that would be fixed as the maximum "squeeze" and if they would be guaranteed protection from fleecing by minor officials and yamen runners. These are but two instances, and no doubt the country is full of others: A general remark which received support before this could be put into type, for there appeared a petition in the Peking papers from merchants who deemed themselves interfered with or obstructed in their efforts to make arrangements for the purchase and smelting of brass cash. The final paragraph of their petition was the following significant statement: "We feel that our project will be doomed to failure owing to aforementioned obstruction, and that either foreigners or unscrupulous persons will collect the cash secretly, or the provinces will start to purchase and smelt the same. *It will teach the merchants a lesson not to have anything to do with the Government.*" Without question the situation that exists in China is that the bulk of the wealthy Chinese will not on any account invest their money in any enterprises in the country when such enterprises are promoted and run by Chinese, chiefly on account of official interference. The foreign banks in the Treaty Ports of China and in Hongkong are the storehouses of millions of dollars belonging to Chinese which if invested in China would make a tremendous difference to the progress of the country. But this money will not be invested solely because, as the editor of the *Ta Kung Pao* says, the people do not trust the Government. Nor will the wealthy Chinese come forward as they should and accord the Chinese Government financial assistance. There are a few who do, but if the Government would establish the confidence that any modern government enjoys among its people the wealthy Chinese could supply sufficient capital immediately to liquidate all of China's foreign debts and inaugurate such a prosperous era in the country that foreign loans would no more be thought of. The greatest monument that any government could contrive for itself in this country would be the mere guaranteeing of security for life and property throughout the land. A Chinese friend who has just returned from a trip through certain central provinces recounts how many people there had told him that they preferred to hoard their silver and bury it in the ground than to trust it in any Chinese bank or in official securities. The state of the domestic loans already on the market is sufficient answer to any question as to the amount of confidence placed by the people in the government. Domestic loan bonds with a face value of $100 and bearing interest at 6% per annum, can be purchased at $60 almost at any time, and some purchases have been made as low as $50! This in itself is a startling commentary upon the standing of the Government in the eyes of the people, and constitutes a stigma which foreigners are staggered to see is borne with complacency. There are one or two men only who seem to be striving to better the financial condition, and around them swarm and struggle a horde of politicians feverishly and wildly wrestling to remove them from office and lay in the dust the experience and the talent that they happen to possess, and which they are endeavoring in the face of the most menacing opposition to employ for the good of China.

In the old days, that is the days of the late regime, the plausible excuse was always available that "the corrupt Manchu" was responsible for all the ills that the flesh of China's Demos is heir to, and maybe he was. For the sake of argument it may be admitted that he was, but the Revolution of 1911 was designed to overthrow him because he was corrupt and because under him the people were oppressed. And the Revolution was successful. Yet, the ills still exist, and still, as the *Ta Kung Pao* bitterly says, the Government is untrustworthy. In the Republican Manifesto to Foreign Nations issued by Dr. Sun Yat-sen, the first President of the Republic, on January 5, 1912, five weeks before the actual abdication of the Manchus, it was set down that "We (the Chinese people) have borne our grievances during two hundred and sixty-seven years of Manchu misrule with patience and forbearance........ Oppressed beyond human endurance we deemed it our inalienable right as well as our sacred duty to appeal to arms to deliver ourselves and our posterity from the yoke to which we have so long been subjected, and for the first time in our history inglorious bondage has been transformed to an inspiring freedom, splendid with the lustrous light of opportunity." And what that escape was immediately to lead to was promised in the following words: "It will be our constant aim and firm endeavor to build upon a stable and enduring foundation a national structure compatible with the potentialities of our long neglected country. We will strive to elevate our people; secure them in peace, and legislate for their prosperity......We will remodel our laws; revise our civil, criminal, commercial and mining codes; reform our finances; abolish restrictions to trade and commerce, and ensure religious toleration." These words were published five years ago, and since that time the world has been furnished with the spectacle of what would seem to be a determined and studied effort to avoid doing any of the things promised. In quarters it is contended that Hell is not paved with good intentions as is generally alleged but with sanctimonious pretensions, a modification which the sceptical will be only too ready to agree applies to China.

The politician's excuse for the failure to apply the energy now being wasted upon violent party struggles to the reform of the country is that those who happen to be controlling the Government are the wrong ones to do so. The allegation is strictly correct, but little evidence of statesmanship, of foresight in the common weal, of real, downright determination to put the State before party is exhibited in the actions of the "outs" who are trying to overthrow the "ins." The sympathies of this paper are with those who are suffering as a result of the failure of the politicians and the officials to combine in inaugurating a progressive programme calculated to be of national benefit, a statement which recently greatly amused a whilom Premier of China who asked with which of the contending parties our sympathies happened to be. And those who are suffering are the great mass of people who are toiling and moiling, inarticulate, poor, and almost without hope, in the vast stretches of the country—people whose standard of existence is of the lowest, whose education is nil, and into whose lives little of the sunshine or the milk of human kindness manages to find its way. While this great body of industrious and strenuous workers wield the hoe in woefully depleted soil to find the wherewithal to satisfy the tax collector, and thereby, metaphorically, endeavour to cultivate one of the millions of acres of neglected possibilities with which the country is blessed, the politicians fight for place. One body of them we believe is impelled with the high motive of giving to the people some of the things to which as citizens of this modern world they are entitled, but the trend of the continuous disputes is obviously towards a Pantisocracy.

When the Manchus were overthrown the founders of the Republic really believed that they were working to establish a Republic in the best sense of the term. Their ideal was a state where government really would be, according to the definition of Burke, a contrivance of human wisdom to provide for human wants, but they have overlooked or failed to control what others believed to be the definition of Republican government. There was considerable evidence within a very short time of the fall of the Manchus that to many Republicanism meant sheer license, that liberty meant freedom to break laws, and that freedom meant liberty to do what one liked irrespective of the checks which every society recognises must be built up for the proper governance and development of the interests of the community. Out of the conflict which has arisen as a result of the lack of some one national banner under which all Chinese who believe they and they alone know how China should be governed could rally, has sprung something extremely akin to chaos. The government that is in power has such shortcomings that proper control of the provinces has virtually disappeared, and records almost from day to day in the daily press are of outrages by bandits and lawlessness of a character which did not exist to anything near the same extent under what little system the Manchus were able to enforce. What has happened is that in the struggle for power *government* has gone by the board, and what apparently is now being aimed at is a state wherein every man is equal to every other man and that all should participate in the ruling of it. A pantisocracy on any scale has never succeeded anywhere else, and we have no confidence that anything of the kind can be established in China, nor do we believe that those who are in the centre of the political arena at the present time want really to try to establish such a thing. But that, to the casual observer, is what the struggle would seem to have as an ultimate object. A regrettable feature of the whole sorry mess is that there is justification for the allegation that loyalty and patriotism have disappeared, and that the Chinese are not capable of governing themselves.

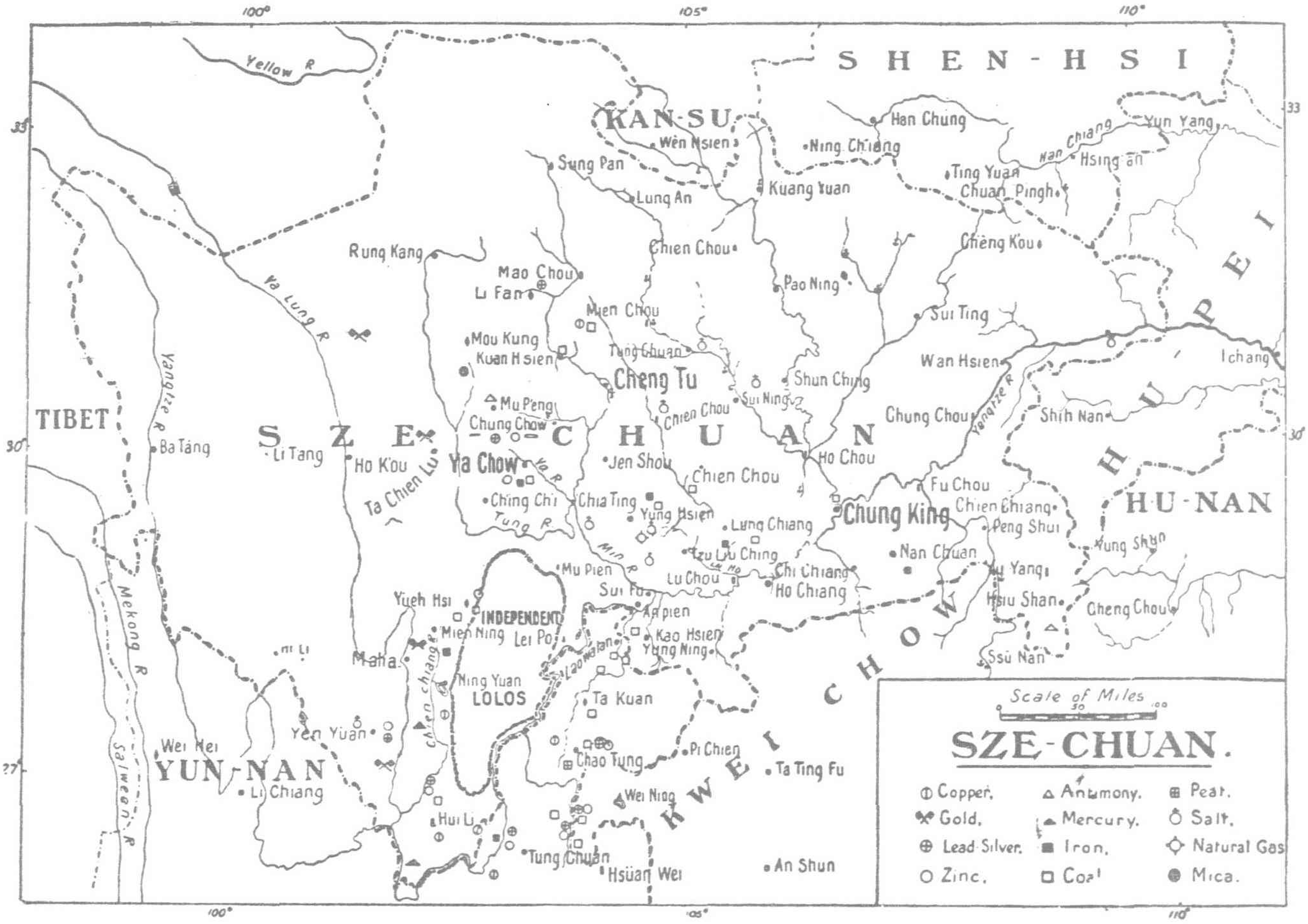
In an endeavour to explain the constant disturbances the Chinese newspaper *Min Yuan Pao* writes as follows: "Why in recent years are disturbances so easy to start in China? It is because of the lack of public spirit among our higher classes of people. If a rich man has a beautiful garden he shuts it up for his own enjoyment. If he has anything good we never hear that he gives it out for the benefit of the public. It is individual happiness versus collective happiness. When the people find that whether in a Republic or a Monarchy they are always left in the cold they say it is time for them to get what is denied them forcibly, if not legally. The consequence of such a state of affairs is ruin for all. The inevitable fate can be avoided only by adopting a new policy of collective happiness." Here is another editor trying to reach out through the murk of politics for a solution of the problem, but before he can obtain collective happiness he will have to contrive security. Walls can only be discarded when the people living within are reasonably sure that they will not be outrageously assaulted or murdered or be in constant danger of robbery. Such a condition can only be secured by political leaders recognizing before it is too late that what they think are "principles" are merely shallow shibboleths the shouting of which deafens them to the realities and needs of the time. There must be one central force which will receive the loyal and unquestioned support of the thinking section of the Chinese if reform is to be inaugurated, and the only way to develop that force at the moment is by leading men courageously abandoning selfish aims for national ones and sinking differences in an amalgamation of the most prominent among the progressives and conservatives to found a government for the simple function, as Gladstone put it, of making it easy for the people to do good and difficult for them to do evil.

At the present moment we have the exhibition of the military dominating the whole situation, and being at loggerheads with, if not entertaining bitter animosity towards, the element known as the Young China party, and which includes in its ranks the material upon which the welfare of the country is ultimately to be built. If the military organization were one which could be respected as a properly controlled, disciplined, and efficient one, officered by men patriotic and loyal, perhaps beneficent legislation might be expected from it. But such is not the case. The army of China is composed of elements which are neither disciplined nor co-ordinated. Out on the parade ground at the Nanyuan headquarters selected troops perform the goose step in the march past the President with a precision which would tickle the heart of the strictest German drill sergeant; but the army to which they belong is known as perhaps the most venal in the world, and no doubt the most undisciplined. It is of no national use yet it eats up national revenue to the extent of about half of that which enters the Treasury. In the budget prepared for 1917, army requirements are modestly set down at $179,192,686. Even so it is a stupendous figure for a force which, instead of being of use, is a proved menace to the country. It not only cannot suppress the brigandage which exists but in many cases it is directly responsible for it, deserting units and even garrisons on many occasions taking arms and ammunition wherewith to terrorise the countryside. And at all times sections of the army are so under the control of individual commanders that the Central Government has no power over them whatsoever. Take the force of some 40,000 men under General Chang Hsun at Hsuchowfu, on the main line of railway connecting Peking with Shanghai. Can the Minister of War order that force whither he pleases and have the order obeyed? Certainly not. Nor could Yuan Shih-kai before him. General Chang Hsun will only operate with his force where he pleases, and it pleases him most to sit tight in the bailiwick he has chosen. It gives him control over the railway and no one dare dispute that control. The Ministry of Communications may shed copious tears in agony at the loss caused by the refusal of Chang Hsun's troops and hordes of followers and friends to pay their fares, but representation after representation, and appeal after appeal moves him not, and he continues cheerfully and lavishly to issue free passes. There is not an official employed in the Ministry of Communications, nor a dozen, nor a hundred of them who would dare dispute the right of even one of Chang Hsun's pig-tailed privates to ride on a train with a free pass. Nothing short of 100,000 troops properly armed and equipped with modern artillery would dare try to make Chang Hsun pay the fares of his men or relinquish what he deems to be his right to treat the railway as a private preserve. While Chang Hsun is perhaps the chief of the "independent" generals, there are, when it comes to a test, others equally determined to obey only the orders that suit them. All of them draw money from the Treasury, and in addition to $200,000 per month extracted therefrom by Chang Hsun he also gathers taxes in the region controlled by him. And Chang Hsun, feared by the Central Government, courted by certain politicians, but hated by all right-thinking Chinese, is a large figure in the political scrimmage now proceeding. He is becoming the hub of the military wheel—or is trying to become so—and at worst he exerts considerable influence in the military coterie.

For the purpose of exercising control of the State the military leaders have now reorganized and are united to a greater or less extent. At least they present a solid front, and their activities at the moment are designed to have the Minister of Finance, Dr. Chen Chin-tao, a foreign-educated expert, removed, as well as the Ministers of Communications and Justice. To secure control of the Ministeries of Finance and Communications would be to have in their hands the revenue of the country, and with revenue they can contrive to subordinate the country to their desires if they so wish it. They claim, of course, that China is not fit for any other than a military government, while, on the other hand, the Young China party is struggling for representative parliamentary government. To hasten the issue it is expected that the military party will very shortly try to give effect to its wishes to remodel the Cabinet. The Premier, General Tuan Chi-jui, one of the strongest generals, will in the ordinary course announce the changes to Parliament, and then it is believed will come the tug of war, for it is not likely that Parliament, with a Kuo Ming Tang majority, will approve the new men proposed. If that happens the prophets expect that the military will call for the overthrow of Parliament —and such a repetition of the worst acts of the late Yuan Shih-kai is likely immediately to have the country once more torn with revolution. The tension is great, but, while feeling runs high, there is yet a chance that the situation may be saved. If the leaders will act in the best interests of China and will come together a speedy settlement and the development of a good government might quickly be realised. But it is questionable if any of the leaders are big enough to put the country before their party. It would be a glad surprise to many close students of Chinese affairs to awaken one fine morning to witness a combination formed comprising the best men to work in the best interests of China. Only by that means it seems to us can China have any hope of rising to the position she is entitled to occupy in the estimate of the world.

JAPAN'S INCREASED OUTPUT OF POTASSIUM CHLORATE

The consumption of chlorate of potash in Japan before the war usually amounted to about 4,000 tons a year, and the demand was met chiefly by imports from Germany and other European countries. The outbreak of hostilities suddenly reduced imports, and prices went to more than five times the pre-war quotations. They have somewhat declined recently. The increased value of potash has stimulated the domestic manufacture of the chemical. Before the war, the only producer in this country was the Nihon Kagaku Kogyo Kabushiki Kaisha, which then turned out more than 300 tons a year. Many producers are now in the field, and, according to an official investigation quoted by the Jiji of Osaka the total output now exceeds 3,500 tons. The domestic production is more than sufficient to satisfy the home demand and recently has resulted in a growing export trade to Russia, China, and the South Seas. Eight firms exported 302,512 pounds in August and 231,756 pounds in September, a total of 534,268 pounds, which is not much less than Japan's total yearly output before the present war began.



MAP OF SZECHUAN, SHOWING MINERAL RESOURCES

AN ENGINEER'S TRAVELS IN WESTERN CHINA

By J. A. T. ROBERTSON.*

The three western provinces of China, from north to south, are Kansu, Szechuan, and Yunnan. Szechuan is the largest of the eighteen provinces, having an area of over 200,000 square miles, and a population usually given as 67,000,000. But this latter figure is only an estimate and, I believe, too great by possibly 15 to 20%. It is also one of the richest provinces of China, and under the Ta Ching Dynasty had to send annually large quantities of silver to its poorer neighbour, Yunnan.

The province has large natural resources, and some, for example its mineral deposits, have hardly been touched as yet. There are plenty of mineral occurrences known, and the traveller finds many workings of a primitive nature. The methods employed are often close parallels to those described by Agricola in the 16th century. But in spite of these numerous small workings little has been done as yet. There are many reasons for this backwardness, among which are: (1) Inaccessibility; although transportation is not any worse than in many districts which are successfully developed in other parts of the world. (2) Primitive methods of mining and metallurgy; for example no explosive stronger than gunpowder is used in any of the mines, and it is only quite recently that any explosive was used at all. Again they have no method of handling water other than the Chinese pump, a wooden chain scraper in a snugly fitting wooden trough, good for lifts of 8 to 10 feet; and a lift pump made of bamboo pipe, good for lifts of up to 24 feet. (3) Inadequate mining laws, and more particularly maladministration on the part of the smaller officials. (4) The fact that much of the mineralized part of the province lies in the mountains along the Tibetan border, which is inhabited by more or less independent tribes who are not friendly to the Chinese. And (5) lack of mutual confidence among the Chinese themselves; this makes it impossible to organize anything but a one-man company, which has not the available capital necessary to overcome the difficulties that always beset the small operator. Therefore the only important attempts to develop certain deposits have been undertaken by the Government.

Cheng-tu, the capital of the province, is one of the cleanest and best governed cities in China. The wall is about 40 to 50 ft. high and about 40 ft. wide on top, and is probably better preserved than that of any other city except Peking. The population, including the residents in the suburbs outside the four old gates, is probably close on half a million. It is the political and educational centre of the province; but from a business point of view is far behind Chung-king, the chief port on the Upper Yangtze.

Having heard much about the southern part of the province I decided to visit it in the summer of 1915. Therefore the morning of June 28 found us aboard our little boat at the Ta-ma-tou just outside of the East Gate. This was the season of high water. Much of Szechuan is particularly adapted to this mode of travel, as the whole of the eastern part of the province is a network of streams, navigable for small boats drawing from less than 1 ft. to about 3 ft. And as all of these streams ultimately join the Yangtze, the great highway of central China, it is possible to get in freight although there is no rail connection to any part of the province.

After leaving the Cheng-tu plain the river winds through low hills of a soft red sandstone, which covers a great part of eastern Szechuan and is classed by Richthofen as basin deposits of probably Jurassic to Cretaceous, and some of it probably as late as Tertiary. It has been much dissected by erosion, forming little ridges and disconnected hills, but through this part it has not been disturbed by any of the later movements common to some parts of the province. The sandstone is soft and easily quarried and has given rise to quite an industry along the river. It makes good foundations, but is rather soft for use where exposed to the weather.

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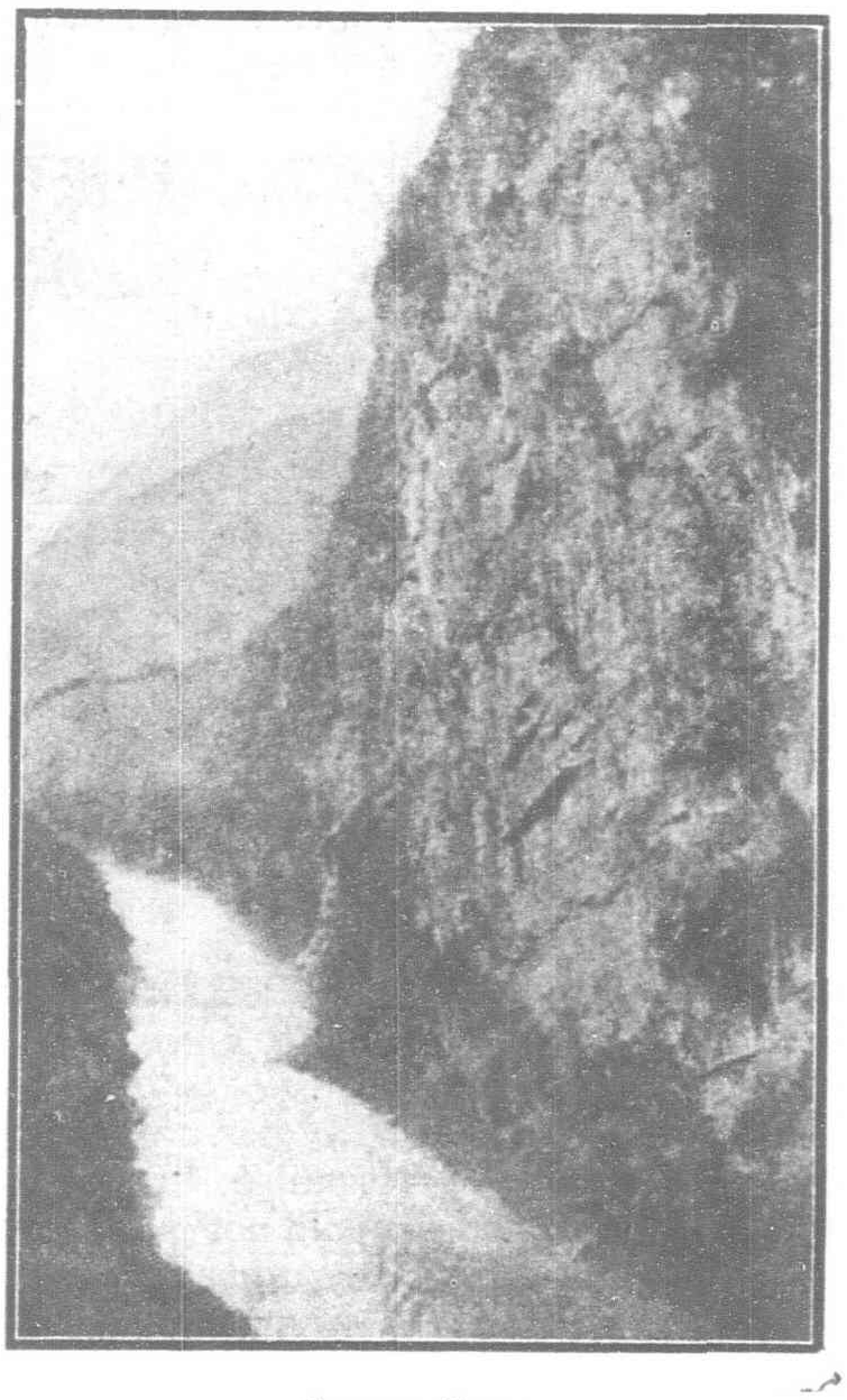
The first important city is Chia-ting, which is a crowded dirty little city of 30,000 or 40,000 inhabitants, built on a narrow point at the junction of the Tung and Min rivers. The Ya joins the Tung just above the city, so that its walls are surrounded on three sides by good sized rivers. Twenty or thirty miles southwest of Chia-ting, Omei shan, the famous sacred mountain of Western China, rises to 10,500 ft. West of Chia-ting, up the valleys of the Ya and Tung, we found many small copper and lead-silver mines, most of which have been abandoned shortly after reaching water level. The remainder were closed for the summer because of the rainy season, when water comes in faster than they can pump it out with their bamboo pumps, and also because like many other small mines throughout the province, they are worked by farmers who were busy attending to their crops. Just below Chia-ting you pass several salt wells, this being the western limit of the great salt-well district of Szechuan which centres around Tze-lui-ching. Throughout this district we found many small seams of fairly good coal, occurring in sandstones and shales that are probably Upper Carboniferous to Cretaceous. Much of this coal, occurring near the rivers, is loaded on to boats and sent up as far as Cheng-tu, where it competes with coal brought down from Kwan-hsien, about 40 miles west of Cheng-tu.

Near the city of Yung-hsien they are working numerous small lenses of carbonate of iron in limestone. The lenses average 4 to 4.5 ft. thick, 20 to 30 ft. wide, and 100 to 200 ft. long, and all those being worked lie within 25 ft. of the surface. They are said to occur over a large area, and the ore averages about 35% iron. No explosives are used, the ore all being broken by hammer and chisel. The roofs are supported by a combination of timbers and pack-walls, the latter built of stone brought from the surface. Labour is plentiful and wages are 100 to 120 cash per day and rice, which costs probably 60 cash per day. The total wage is equal to about 3d. per day. The ore is broken to 1 to 1½ inch lumps and calcined with wood in kilns of about 2 tons capacity, the operation occupying 4 days. The calcined ore is smelted with charcoal in small stone furnaces, about 16 ft. high and 8 ft. diameter. The blast is supplied by hand-operated piston blowers, through two tuyeres in the back wall. Practically all the iron is used in casting evaporating pans for the salt wells. No smelting is done during two or three months of the hottest weather.



COFFIN CLIFF

At Sui-fu the Min joins the Upper Yangtze, or as it is called the Golden Sands River, the reddish brown water of which makes the muddy Min look clear by comparison. This stream brings down great loads of sediment annually, and at almost any place above Wan-Hsien during low water you can find men washing the gravel, brought down by the last high water. I have often watched them make their clean-up, and wondered how they make a living, and what is the economic limit at which they stop washing. At some places I am sure they do not average 50 cash per day, but they work this during the off season on the farms when there is often nothing else to do. Farther up they find coarse gold in places, but as soon as a discovery excites much attention the district is withdrawn by the Gold Mining Bureau, which has recently been formed to furnish the gold to put Chinese currency on a gold basis. The accompanying photographs illustrate the type of rocker used and the method of operation.

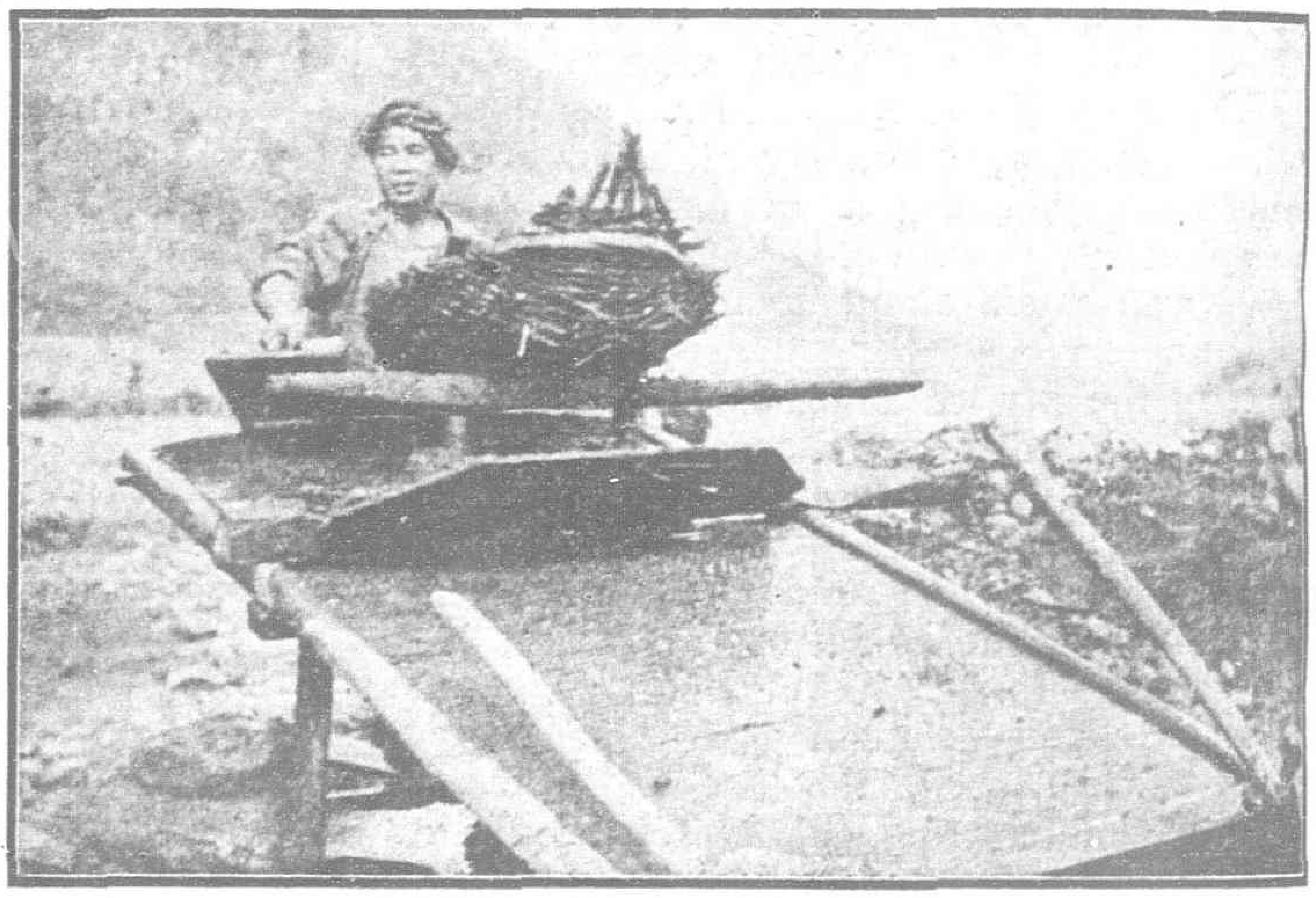
The river at Sui-fu is only 800 ft. above sea level, but the city is surrounded by hills, some of which rise to 2000 or 2500 feet, and on four or five of them can be seen pagodas, a liberal allowance for even an ambitious city. This is the terminus of one of the two routes which have been surveyed for the extension of the French railway from Yunnan-fu to the Yangtze. Although a British gunboat has visited Chia-ting every summer in highest water for some years, Chung-king is still the head of steam navigation on the Yangtze, but there will probably be steam service between Chung-king and Sui-fu in the near future. From Sui-fu the road follows up the north bank of the Yangtze for about twenty miles, and then crosses to the south side and follows up a small stream, practically along the line of the proposed railway.

At An-pien where the road crosses the river, I was told that the coal mines were not more than three miles farther up. They proved to be nearly ten miles away, the seams are from 1 to 4 ft. thick, and occur in sandstone near the top of the hills on both sides of the river. The coal is swung down to the river on bamboo cable-ways. Where there are ledges of any width below the mines they have to operate the cable ways in sections, as the sag is so great that the baskets could not clear the ledges. The track cables are plaited of flat strips of bamboo (much like the towing ropes used by the boatmen) and are about 4 inches in diameter. At the lower terminal, provision is made for taking up the slack by taking a hitch on the track cable with a smaller rope, also of bamboo, which passes around a roller log. This log is turned by capstan bars and blocked when the desired tension is obtained. The haulage rope is 0.75 in. diameter, also of bamboo, but twisted in three strands. One end of it is attached to a bamboo basket on each of the track cables. At the upper terminal it makes several turns round a vertical drum and the speed is controlled by other bamboo ropes acting as friction brakes on this drum. The particular cableway I examined took about 40 seconds for the trip, not reckoning the time the lander takes in dumping the basket, which may be ten minutes if he happens to be smoking when it comes down. This pair of ropes is said to cost 40,000 cash (£2.14s. 5d.) and lasts one year. The coal is loaded on to boats and dropped down to An-pien, where it sells for one cash per catty (1.33 lb.) or about 2s. 3½d. per ton. Farther up the river are a number of lead-silver mines, but I did not have time to visit them.

Some of the small streams along the road are crossed by what was a new form of bridge to me, and appears to be a connecting link in the evolution of the bridge from the stepping-stones. A row of stone piles are set into the bed of the stream, and stand as much as 10 to 15 feet above ground. They are spaced close enough that each just makes a step, and they are notched on the edges to receive a short plank which completes the bridge. But as this was the rainy season, and any of these inoffensive looking little streams might become a raging torrent at a moment's notice, the planks had been removed to prevent their being washed away and the bridge consisted only of stepping-stones. The larger streams are crossed by suspension bridges of iron chains, the links of which are usually bars varying in length from a couple of feet to nearly 100 feet in a few cases, and about 3 inches in diameter. Usually the floor boards are supported on eight or ten of these chains and two or four more from the side rails. But at Lao-wa-tan there is a really fine specimen, built much like our suspension bridges, with seven chains on each side, from which a well arched and well braced floor is suspended by smaller vertical chains.

Shortly after crossing the Yunnan border, we arrived at Lao-wa-tan, a dirty but busy little town at the head of navigation on the stream we had been following. The packtrains bringing down tea, lead, and copper all stop here, and what is not taken down by boat is carried by coolies. They say that the coolie union will not allow the animals to come down any farther. Like most Chinese market towns, it consists of one long street; the buildings on one side backed up against the hill while those on the other overlooked the river. Coal seems plentiful and can be bought for from one to three cash per catty at any place along the road. About three miles below Lao-wa-tan they are getting salt from springs by the river side. In fact all but one of them was drowned out by the high water. It was only a little hole in the broken limestone a few feet back from the river and connected with it by cracks in the broken formation, so that the brine was about as muddy as the river itself. The brine was warm, 109° F., while the atmospheric temperature at the time was only 86°, and it was hardly as salt as sea water. They told me that at low water it was much hotter, stronger, and clearer. At this time they were only getting 10 oz. of salt from 100 lb. of brine, but at low water they said that they got a little over one pound. The salt tastes well, but is grey with dirt. It sells for 100 cash (1⅓d.) per catty. At Tou-sha-kuan the river flows through a narrow gorge with practically vertical limestone walls reaching a height of 400 or 500 ft. at the western end, with the strata dipping away toward the east. There are many little caves in the limestone with large stalactites hanging from the roof.

Washing Gold Gravel on the Yangtze River below Chung-king



Chinese Rocker used in washing Gold Gravel

From the Yunnan border to a little past Ta-kuan the rocks are principally limestone with smaller amounts of interbedded sandstones grading into shales. At some places the limestone is thick and massive, while at others it is closely interbedded with shales, the individual laminæ being only about an inch thick. The limestone is rich in fossil remains, but as my time was limited, we had to keep pushing along, and I was not able to spend any time collecting. However, I was able to pick up about fifty specimens. These indicate that the rocks are probably Permo-Carboniferous.

About ten miles beyond Ta-kuan our road suddenly seemed to end, for the stream that we had been following rushes out from under a limestone cliff, while the valley ends in a little amphitheatre, the only opening from which appeared to be the notch by which we had entered. But just as I was thinking that I must have passed the road in the little village called the "origin of water" where my men had stopped, it turned suddenly to the south up a rift almost along the contact of the limestone with a basaltic rock. The latter was the first igneous rock we had seen on the trip.

From the summit we had a grand view through a little break in the hills, where a regular sea of mountains, with white fleecy clouds hanging over them, stretched away to the east or north as far as the eye could see. The road then led out into a flat and in some places marshy alluvial basin. A small muddy stream meandered across this basin until it disappeared into a sink-hole, and pursued a subterranean course to where we saw it issuing in the valley a thousand feet below.

We were now on the Yunnan plateau, where it is a common sight to see a stream disappear into the hills and be lost for a time. From now until we neared Ya-chow our road lay between 6,000 and 10,000 feet above sea level, except where it dipped in the valley of a few of the larger rivers. Although the sun was nearly vertical, there was always a pleasant breeze, and the thermometer rarely rose above 75° in the shade, while the nights were always cool.

Following up this little stream to its source and climbing over a low range of hills we descended on to the Chao-tung plain, as it is called, though it is really a basin about 30 miles by perhaps 20 miles at its widest. The roads across the plain are badly cut up by their ox carts, of which they are very proud. Chao-tung is the most important military and political city of northern Yunnan. West of Chao-tung they have recently opened up several copper mines, but owing to lack of capital they have not done much with them as yet. In Chao-tung I met an old Lolo chief, Mr. Long. He was interested in a silver mine, which he said they had been forced to abandon because of gas and he was anxious to take me into Lolo-land to look at it. He promised to take me across Lolo-land to Ning-yuen, but said he could not guarantee the safety of Mr. Wang, my interpreter, or any other Chinaman.

The owner of an abandoned lead-zinc mine, a few miles below here, which we had looked at, sent word that he would be glad to give me the mine provided that I would give him a good job. We followed on south along the Kweichou border, visiting several lead-zinc mines. We were now off the main road or in fact any road at all, and we put up with some farmer wherever night overtook us. One day we passed a house where they were counterfeiting the small cash. I asked how they could do it at the present price of copper and zinc and they said they used lead instead of zinc.

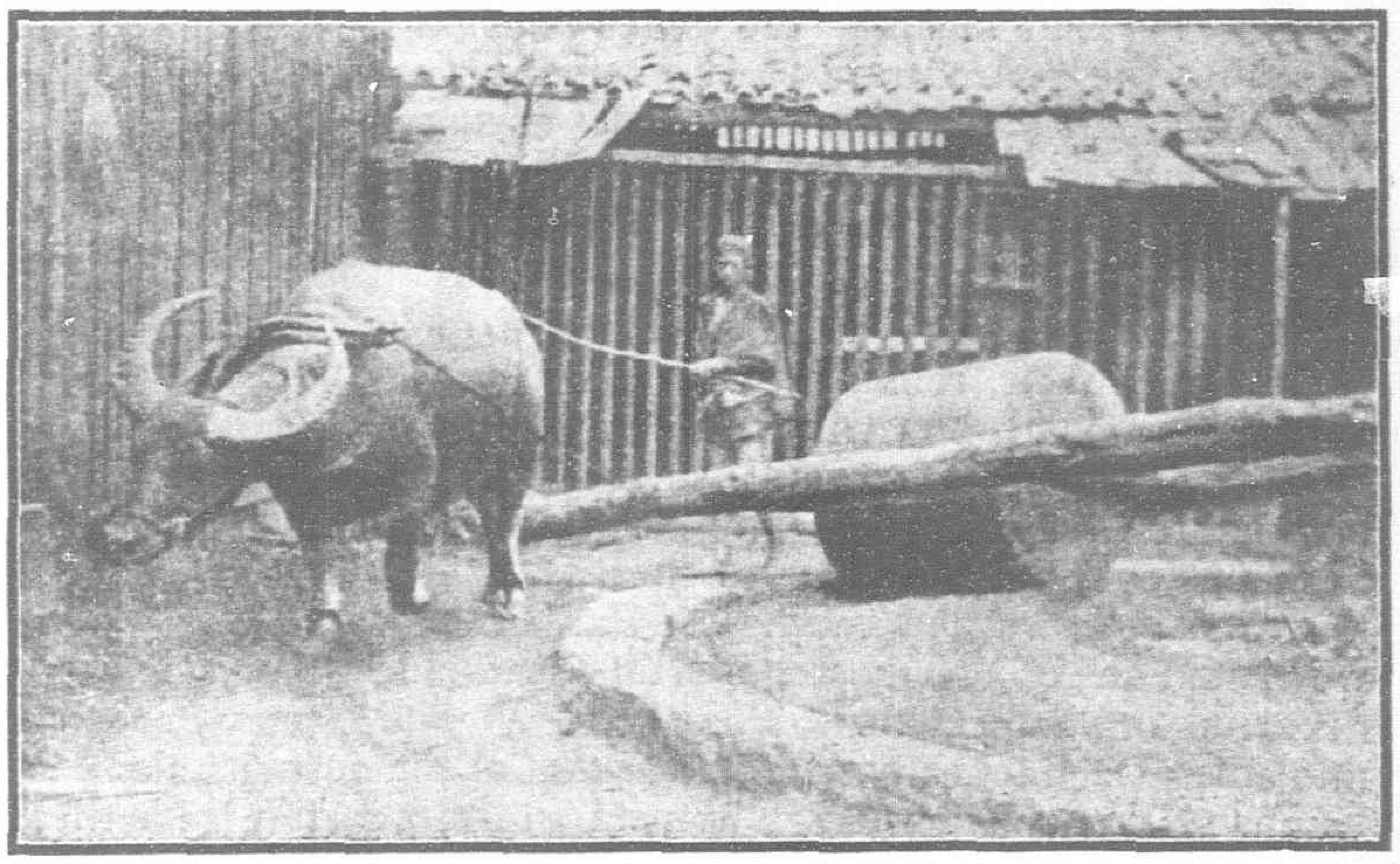
We found the most important of the silver-lead-zinc mines of this district at Kung-hsien, in much fractured limestone within a few hundred feet of the contact with a basaltic mass. The mines originally belonged to the Miao from whom they were purchased by two Chinese merchants. Now they are under the control of a government mining office, which operates four shafts and buys all the ore and metal from the tributers. There are shafts scattered all over the town, but most of them, 14 or 15, go down from a small open pit on the hill just above the town and close to the igneous contact. The largest and deepest mine is said to have between 8 and 10 miles of workings; but they assured me that I could not get through many places in it, and advised me to go down a smaller but more recent shaft with larger workings. Even here I had to crawl on my hands and knees for hundreds of feet at a time. But most of the passages are about 4 ft. high by 2½ ft. wide. They are all closely timbered with tunnel sets of scrub pine, about 3 inches diameter, but the sets are only about 9 inches center to centre. Behind this is close lagging of the same pine, split thinner than shingles and 18 to 24 inches long by 2 to 4 inches wide. They said that most of this had been put in during a previous period of operation over thirty years ago and it still seemed perfectly sound. In the shaft, or more steeply inclined parts, the sets have four members, the sill pieces serving as a ladder. But as it is not open behind them you barely get a toe or heel hold and it is impossible to wear shoes with stiff soles underground.

The shafts start down at an angle of 70° or more and proceed by a series of spirals and zig-zags. Sometimes the working is nearly horizontal, at others vertical, and in some cases takes an up grade for a time, as the miners follow the ore with no fear of litigation on the charge of trespassing. From this main entry numerous little galleries led off to either side where they had followed some little stringer of poor ore. These they call "guides," and they say that these never fail to lead them to a rich lens or pocket of ore. The zinc is all carbonate. The lead is principally present as galena, often in seams of loose sand or soft mud, and most abundant in the lower workings. They have no trouble with water and are thus able to work to considerable depth. When within about 30 ft. of the bottom our lights were put out by carbon dioxide, but one of the men climbed down and chipped off samples of the "lead guide" they were following. When the gas collects in their shaft, they blow it out with a small fan until it gets too bad even for this. They then have to abandon the work until a more favourable season. No explosives are used. The ore is all carried out on men's backs in bamboo baskets. The men receive 100 small cash per day and rice, or about 3d. per day, and in this mine they make four or five trips a day.

The ore is carefully hand-sorted, and the lump zinc ores are divided into four grades according to the texture and size. The fines are washed in hand screens. A little of this is smelted at the mines, but most of the smelters are established at the coal mines by the river, about five miles from the mines. The zinc furnaces hold from 48 to 72 fire-clay pots, 6 inches diameter at the top and tapering to 1 or 2 inches at the bottom, and 18 inches deep. The ore receives no preliminary calcining, but is mixed with coal and filled into the pot. A cylindrical extension 6 or 8 inches long is luted on the top. A small stick is placed against the side of this to provide a passage for the zinc vapour, and a layer of fine moulding sand is packed in and scooped out to form a little cup to receive the condensed zinc. A flat fire-clay cover is placed on top and luted all round except for a little hole on one side for the gases to escape through, and the pot is then ready for the furnace. They put through one charge per 24 hours. The pots cost about 1d. each and last about 30 charges. The yield from these ores is 1 to 1.5 catties of zinc per pot. It requires four men to operate each furnace of 72 retorts. At present all the zinc is being sent to Yunnan-fu for export because the manufacture of cash had been suspended on account of the high price of zinc.

The lead ores are smelted in small mud shaft furnaces, with a depth of charge of 3·5 to 4 ft. The normal charge consists of 2 parts ore, 1 part coke, and 1 part rich slag. The blast is supplied by a large piston bellows of the usual Chinese type, operated by eight men in two relays. As the charge smelts it runs down into a little fore-hearth scooped out in front of the furnace. The slag cools on top, forming a crust, which is raked off from time to time. The upper part is discarded, while that next to the lead is saved for re-smelting. The lead is ladled out once a day. These furnaces remain in blast from 10 days to one month, when they require re-lining and general repairs. All of this lead contains more or less silver, and when it runs 10 or 12 taels or over per ton it is cupelled. As far as I could gather that seemed to be the economic limit below which cupellation cannot be conducted profitably. The cupels are oval in shape, about 4 ft. by 3 ft., and made of wood ash. Straw is laid on the bottom of this, and then the charge of about half a ton of pig lead; then a clay arch is built over the longer axis, and a grate of fireclay rods extends from this arch to the rim of the cupel. A mud dome is built over the cupel, and live charcoal is filled in on top of the grate. The cupellation requires two days. The litharge is reduced in a shaft furnace. Most of the lead is sent by pack train to Sze-chuan.

At Tung-chuan, which is a pretty little city with many fine old trees, nestling in a fertile plain among lofty mountains, we visited the government copper refinery and cash foundry. The copper comes principally from the district southwest of the city along the Yangtze. A little native copper is obtained, but most of it comes from oxide and rich sulphide ores. These are smelted to blister copper at the mines and brought to Tung-chuan by pack mule. The refining furnaces are built in pairs, one of which is operated every other day while the other is being re-lined. They are built of sandstone blocks, and the crucible, of mud, about 2 ft. diameter by 20 inches deep, holds a little over 1000 catties of copper. Over this is a sandstone arch which supports the fire of coke and charcoal. In the back wall there is a tuyere opening through which air is blown downward on to the surface of the molten copper. Small pieces of charcoal that fall through the grate above along with the scum of oxides are raked out through a small opening in front. The melting and refining takes 8 to 10 hours, and a new crucible has to be built each time. The process is, I believe, a Japanese one, with probably some slight modification.



Arrastre Plant in Szechuen

The skimmings are crushed under a large stone roller drawn by a water buffalo, as shown, and washed in a sluice for the recovery of any copper it may contain. The tailing is flushed into a ditch outside the wall, where a number of old women pan it again, getting a little copper and much partly burnt coke. There are four pair of furnaces in operation. Two of these are supplied with air from the usual Chinese blowers. The other two are supplied from two blowers operated by the most dilapidated steam engine I have ever seen. This engine was supplied from three upright boilers all under steam at 36 lb. pressure. From the look of them I should not care to try to raise the pressure. The coal all has to be brought a two days' journey by pack mule. I should like to know the relative cost of operating the two units. We took a look round the cash foundry adjoining the copper refinery. It was closed, and all there was to see were a few of the moulds, with a double row of cash and the feeder down the centre. After the cash are broken off, the rough edges are filed on a small foot-lathe. They say that they cast 250,000 cash per day when running.

Here I was told about an attempt to open a gold mine about ten miles from the city, but when the ore was put in the furnace it all volatilized, leaving no residue of any kind. They could not describe the ore at all, and they had no specimens. When I offered to send a man for some, they told me it was all gone now. Evaporated, perhaps! Suitable for a certain type of promoter! At Hui-li-chou I heard about evaporated ores again, but this time it was a copper ore.

We crossed the Yangtze by the ferry at Meng-ku, where it flows through a narrow valley 4000 ft. deep. In descending to the river the road in several places passes through a tunnel about 7 ft. high by 6 to 8 ft. wide cut out of the limestone parallel to the face of the cliffs, and lighted by means of small holes broken out every few feet. It is hot in the valley. Sugar-cane flourishes and the town of Meng-ku has a sugar industry.

The country between here and Hui-li is wild and picturesque, but little travelled. For two days we were among the semi-independent Lolos. Hu-li is the centre of an important mineral district, perhaps the best mineralized district in the province, but at present they are interested very little in anything but copper. Most of the mines are south of the city, but they also bring in copper from a distance three days to the north. Many of the mines were closed for the summer, and the others were having much trouble with water. In one of them they had 48 pumps working in 24 lifts, with two pumps on each lift. They said that in the winter one pump for each lift could handle all the water, but now two were having much difficulty to handle it. As there was not room to put in a third, they would have to close if the water became any worse. Besides copper they are also mining iron, coal, silver-lead-zinc, mercury, and gold-bearing quartz. Much placer-mining is done in this district. They also have antimony, and I am told nickel, but these are not being worked. There is another government copper refinery here, on the same lines as that at Tung-chuan minus the steam engine. Instead of crushing and sluicing the skimmings and returning the concentrate to the refining furnace, they smelt them in a small shaft-furnace. The copper is all sent to Cheng-tu by pack mule at a cost of 5 taels per 100 catties for freight, or about £11 8s. per ton.

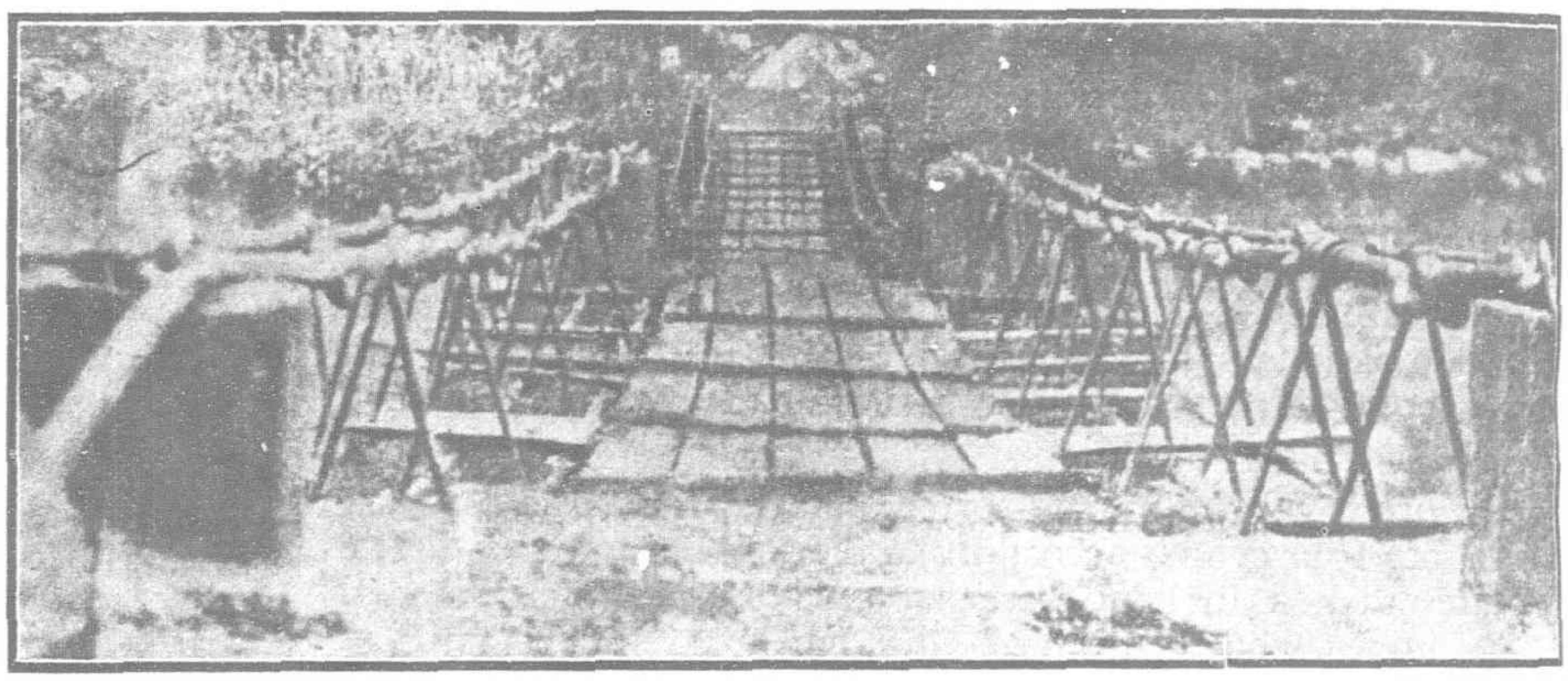
Leaving Hu-li we were once more on a big road, but it reminded me more of the bottom of a sluice-box with boulder pavement. For it was paved with round, smooth igneous boulders of all sizes, and any earth that had been put over them to fill up the spaces had long ago been washed away. At Pai-kou-wan we visited one of the most important lead-zinc deposits in Sze-chuan. The geology and mineralogy is practically the same as that of the deposits along the Yunnan Kwei-chou border. The metallurgical practice is identical, except that the average yield per retort is lower, due to poorer ores. Their retort pots are of an inferior grade, and only last 15 to 20 charges. I found the smelters feeling angry because they have to sell all their zinc to the government mining office for 3·50 taels per 100 catties, while the price in Yunnan-fu at the time was 28 taels and the freight could not be over 5 to 6 taels at the most.

They are mining gold-bearing quartz at Wali and Ma-ha, but as the Gold Mining Bureau had just taken these over, there was little work being done, as nobody seemed clear how it affected them. At Ma-ha they have part of a milling plant, which was installed some twenty years ago, and was the first attempt at using foreign machinery in Sze-chuan so far as I know. I believe it ran for a time and is reported to have made money, but lay idle for many years until July, 1914, when the government in Cheng-tu decided to put it in commission again and appointed Mr. Lew, a graduate from Liége, manager. At the time of my visit he had just succeeded in replacing lost parts, and cleaning off years of rust, when word came from Cheng-tu to close down and return to the capital. This property was visited by Dr. R. Logan Jack in 1900.

At Yen Yuan they produce salt, which is white compared with that from Tze-lui-ching. The natives say that using this white salt causes goitre. Whether there is anything in the salt that might cause it or not I do not know, but all the way from Chao-tung to Ning-yuen we noticed that the majority of the people were affected with it, and practically none of the Tse-lui-ching salt gets south of these two cities. In the salt-well district here they use a small cash that is if possible even smaller than those made in Tung-Chuan and change 2300 to 2400 for a dollar. I was rather disappointed in the Chien-chiang valley, about which I had heard so much, but Ning-yuen is a beautifully situated little city. Nestling on the gentle slope of a spur of the main hills it looks out over a pretty lake, beyond which the mountains rise to 14,000 feet.

At Ching-Chi-hsien we joined the main road from Ta-chien-lu, and from here into Ya-chow we met a continual stream of packers carrying brick tea for the Tibetan trade. They carry great loads, sometimes well over 300 lb., and make short stages. And besides this load of tea each man must have one measure of rice, 30 catties, for the troops before he can pass the li-kin station at Ya-chow. After crossing the Big Pass, which is only a little over 9000 feet, but has a climb of 6000 feet or more on either side, we were in the Ya-chow district. This is a well mineralized district and much more accessible than the Hui-li district. I hope to be able to make a much more careful survey of it in the near future. They are at present mining lead-silver, zinc, iron, copper, antimony, anthracite, and bituminous coal in the district, as indicated on the accompanying map.

Leaving my interpreter at his home in Ya-chow I pushed on, arriving in Cheng-tu on September 2, bringing to a close an exceedingly pleasant trip, during which I managed to see a good deal of the country, in a hurried way, and at very little cost. We practically lived on the country as we went along, and with the tea, coffee, cocoa, sugar, milk, a few tins of biscuits and cheese we carried, we had no complaint to make, thanks to my boy, who is an expert at making the best out of nothing, and with nothing as it often appeared to me. After selling our ponies the whole trip cost just about £50.—*The Mining World.*



A Chain Bridge used in Western China

NEW STEEL WORKS IN MANCHURIA

Among the various enterprises of the South Manchurian Railway to be undertaken in 1917, will be the construction of a steel works near Anshanchan. It is planned that lime, which is one of the requisites for steel manufacture, will be obtained from a hill near Penchihu, while the supply of coke, which forms another important requisite, will be procured in part from the Penchihu Colliery & Mining Co., to be used together with Fushun coke. Figuring the initial annual output of pig iron at the new steel works to be about 150,000 tons, some 300,000 tons of coke a year are expected to be wanted.

The large area was quietly purchased by the railway company recently and it has only just been announced that the object was the establishment of a large steel works. Consequently there has been a great rush for both land and buildings in the vicinity, adjoining lands have doubled in price, and the rent of buildings has reached a fabulous figure, $50 a month payable a year in advance for small hut with an 18-ft. frontage, says a Tairen paper.

JAPAN'S LATEST DEMANDS ON CHINA

Summary of the Negotiations Leading to the Settlement of the Chenchiatun Affair.

In August, 1916, a dispute between a Japanese merchant named Yoshimoto and a Chinese soldier of the 28th Division stationed at Chenchiatun led to a fracas between Japanese and Chinese soldiers. The Japanese soldiers had been in Chenchiatun for over two years. They had no justification for being there. The Chinese Government had repeatedly protested against their presence.

A Japanese policeman who was informed of the dispute induced a Japanese Lieutenant to lead some Japanese soldiers to the Chinese barracks to demand satisfaction, a fracas ensued in which four Chinese and twelve Japanese soldiers were killed and others wounded. The Japanese troops were reinforced and new detachments were stationed at posts on the highway between Chenchiatun and Ssupinkai.

On September 2nd., the Japanese Minister submitted to the Foreign Office a series of eight demands divided into two categories. Four were Demands properly so called and four Desiderata.

The Demands were:

1. Punishment of the General commanding the 28th Division.

2. The dismissal of the officers at Chenchiatun responsible for the occurrence, as well as the severe punishment of those who took direct part in the fracas.

3. Proclamation to be posted ordering all Chinese soldiers and civilians in South Manchuria and Eastern Inner Mongolia to refrain from any act calculated to provoke a breach of the peace with Japanese soldiers or civilians.

4. China to agree to the stationing of Japanese police officers in places in South Manchuria and Eastern Inner Mongolia where their presence was considered necessary for the protection of Japanese subjects. China also to agree to the engagement by the officials of South Manchuria of Japanese police advisers.

The Desiderata were:

1. Chinese troops stationed in South Manchuria and Eastern Inner Mongolia to employ a certain number of Japanese military officers as advisers.

2. Chinese Military Cadet Schools to employ a certain number of Japanese military officers as instructors.

3. The Military Governor of Mukden to proceed personally to Port Arthur to the Japanese Military Governor of Kwantung to apologize for the occurrence and to tender similar personal apologies to the Japanese Consul General in Mukden.

4. Adequate compensation to be paid by China to the Japanese sufferers and to the families of those killed.

In deference to the expressed desire of the Japanese Government the Chinese Government did not discuss the rights and wrongs of the case itself but proceeded direct to the discussion of the foregoing demands and desiderata, the Chinese Government throughout the negotiations being animated by a sincere desire to meet all Japanese proposals in a spirit of friendly compromise.

From September 9th to November 24 frequent conferences were held, and the five demands embodied in the exchange of notes later referred to were verbally agreed upon. While disposed, however, to make every concession consistent with the preservation of China's sovereignty, the Chinese Government could not consent to the stationing of Japanese police officers in South Manchuria and Eastern Inner Mongolia and to the employment of Japanese military advisers and instructors.

On October 18th the Japanese Minister submitted a memorandum setting forth the duties of Japanese police officers and seeking to prove that these duties would not conflict with the duties of Chinese police in the same areas.

Dr. Wu Ting-fang, after having assumed charge of the Ministry of Foreign Affairs, continued the negotiations on December 19th. Several conferences were held, the Japanese Minister pressing for acceptance of the Demands for the employment of Japanese police officers and military instructors and advisers, the Foreign Minister contending that such demands were neither just nor reasonable.

On January 5th the Japanese Minister handed the Chinese Government three notes *verbales*.

The first had regard to the engagement of military instructors in Chinese cadet schools, and explained that this desire on the part of Japan was inspired by the wish to assist in the development of a friendly spirit on the part of the Chinese military in Manchuria and in Eastern Inner Mongolia so that future recurrence of similar misunderstandings might be avoided. Japan expressed the hope that Japanese military instructors in the Cadet schools would be appointed. Inasmuch, however, as the question was one which concerned Chinese military affairs it ought to be left to the discretion of the Chinese Government, and the Japanese Government would not insist upon it.

The second had regard to the employment of military advisers in South Manchuria and Eastern Inner Mongolia and affirmed that this proposal on the part of Japan was inspired by the hope of bringing about a friendly interchange of views between the military of the two countries so as to prevent misunderstandings. Japan expressed the hope that Japanese military advisers in South Manchuria and Eastern Inner Mongolia would be appointed. Inasmuch, however, as this was a question concerning the military administration it must be left to the discretion of the Chinese Government, and the Japanese Government would not insist upon it.

The third note *verbale* had regard to the stationing of police officers. Japanese subjects, it said, travelling and residing in South Manchuria and Eastern Inner Mongolia must increase. For their protection and the preservation of order among them and to prevent misunderstanding it is necessary to increase the establishment of Japanese police officers and police stations. This is a corollary of the rights of extraterritoriality and does not violate Chinese sovereignty. Should the Chinese Government not express its concurrence with this view the Japanese Government would nevertheless, in case of necessity, be forced to carry it into effect.

After due consideration the Chinese Government replied on January 12th:

> 1. In the military cadet schools China has hitherto employed only Chinese instructors. She has no intention at present of employing foreign military instructors.
>
> 2. In the office of the Military Governor of Mukden a Japanese military adviser is already employed. The Japanese note *verbale* was noted.
>
> 3. In regard to the stationing of Japanese police officers the Agreement of May 25th, 1915, provides that all Japanese subjects in South Manchuria and in Eastern Inner Mongolia referred to in the Agreement shall "*submit*

to the police laws and ordinances and taxation of China." Questions arising from extraterritorial rights were thus provided for. Although the Japanese Minister may give an assurance that the Japanese police will not infringe the rights of the Chinese police and of the Chinese local Administration, the stationing of Japanese police (in Chinese territory) will impair the spirit and the form of Chinese sovereignty and provoke misunderstanding on the part of the Chinese people to the detriment of friendly relations.

In regard to those Japanese police stations already established in Manchuria, the Chinese Government and Local Authorities have repeatedly protested against their presence. From investigations made by their delegates the Chinese Government are convinced that it was the Japanese police officer illegally stationed at Chenchiatun despite the protests of the Chinese Government (Chenchiatun being Chinese territory far removed from the Railway Zone) whose action was the direct cause of the regrettable conflict. The Chinese Government can never consent to the establishment of Japanese police stations in South Manchuria. It again protests and asks for the removal of those police stations already established.

The Chinese Government therefore requested that this demand should be abandoned and declared that it could not recognize any action taken in pursuance of the Japanese statement that should the Chinese Government not express its concurrence with this demand the Japanese Government would nevertheless in case of necessity carry it into effect.

The negotiations ended by the Governments agreeing to embody in an exchange of notes the following five stipulations:—

1. The General Commanding the 28th Division will be reproved.
2. Officers responsible will be punished according to law. If the law provides for severe punishment such punishment will be inflicted.
3. Proclamations will be issued enjoining Chinese soldiers and civilians in the districts where there is mixed residence to accord considerate treatment to Japanese soldiers and civilians.
4. The Military Governor of Mukden will send a representative to Port Arthur to convey his regrets when the Military Governor of Kwantung and the Japanese Consul General are there together.
5. Solatium of $500 (Five Hundred Dollars) will be given to the Japanese merchant Yoshimoto.

The Chenchiatun incident having originated in a conflict between Chinese and Japanese, the Chinese Government considers that all Japanese soldiers within the district should be withdrawn in order to prevent any future disturbance. On January 22nd the Waichiaopu requested the Japanese Minister to state on what date the Japanese soldiers stationed between Ssupinkai and Chengchiatun would be withdrawn. On the same day a reply was received from the Japanese Minister stating that when the Five Articles agreed upon are executed the Japanese troops sent to reinforce the Japanese detachment at the time of the incident will be withdrawn.

Throughout the negotiations the Chinese Government, always animated by a spirit of compromise, has been desirous of coming to a friendly settlement with Japan, as proved by the concessions made. It confidently hopes that the Japanese Government will recognize this manifestation of good will and by the mutual exercise of greater discipline and restraint in Manchuria in the future any recurrence of such regrettable incidents will be avoided.

The documents in the case follow:

Memorandum from Japan to China

The Imperial Government of Japan feels that the unfortunate Chengchiatun incident should occur suddenly and at a time when the relations between Japan and China have recently greatly improved, and their mutual friendship has, just then, marked the beginning of a new era, is a matter of deep regret. It, having made a careful investigation of the facts from all sides, is sincerely hoping for the rendition of an equitable decision based thereon. In a word, the present case arose out of the provocation on the part of the Chinese soldiers. Furthermore, the fact that the Japanese forces were invested and attacked by the Chinese soldiers admits of no doubt. Hence, it cannot be questioned but that the matter is a serious one. The Imperial Government, however, paying great regard to the relations between Japan and China, feels compelled to present this memorandum with a view to settling the case in dispute in a peaceful manner.

The Chinese Government is called upon to immediately effect the following provisions:—

Punishment of the General Commanding the 28th Division. The dismissal of all Chinese Military Officers responsible for this incident as well as the severe punishment of those who took direct part in the fracas.

Proclamations to be posted enjoining the whole body of the Chinese troops stationed in South Manchuria and Eastern Inner Mongolia, to refrain from again provoking the Japanese forces, or soldiers, or other Japanese subjects, by either word or act; such proclamation to be also widely published by all Chinese officials functioning in those regions for the general information of the public.

To Agree that the Japanese Government may, with a view to the protection and government of the Japanese subjects in South Manchuria and Eastern Inner Mongolia, send Japanese police officers to function at those places where considered to be necessary; also let the Chinese officials in South Manchuria employ more Japanese to serve as police advisers.

The following are optional with the Chinese Government:—

Every Chinese army headquarters stationed in South Manchuria and Eastern Inner Mongolia employ a certain member of Japanese military officers as advisers.

Chinese military cadet schools to employ a certain number of Japanese military officers as instructors.

The Tuh-Chun of Fengtien Province to pay a personal visit, and to apologise to both the Governor of Kwantung and Japanese Consul-general in Mukden.

Adequate compensation to be paid to the sufferers or their families.

Note Verbale from Japan to China

Peking, the 5th day of the 1st month
of the 6th year of Taisho.

The statement that if the Chinese Government should employ foreign advisers on military affairs in South Manchuria, Japanese will be employed first etc., has been made in the note dated May 25th of the 4th year of the Republic of China, annexed to the treaty respecting South Manchuria and Eastern Inner Mongolia. As the employment of Japanese military advisers will facilitate mutual understanding between the military authorities of the two countries, and further as there is no doubt that this will help to prevent various troubles which may arise out of misunderstanding, the Imperial Government entertain the hope that the Chinese Government will continuously employ Japanese military advisers. However, it is not proper for the Imperial Government to insist upon this matter since it concerns the military affairs of the Chinese Government and should therefore, be left to the discretion of the Chinese Government.

Reply by China

Peking, the 12th day of the 1st month of the
6th year of the Republic of China.

The Minister of Foreign Affairs has the honour to acknowledge the receipt of the Japanese Minister's Note Verbale of January 5, stating that

(Japanese Note repeated)

The Minister of Foreign Affairs has to state that there is a Japanese military adviser already engaged in the Tuchun's Yamen at Fengtien. The Note Verbale is Noted.

Note Verbale from Japan to China

Peking, the 5th day of the 1st month
of the 6th year of Taisho.

The Imperial Government hopes the Chinese Government will employ a number of Japanese military officers to be instructors in military cadet schools. This is aimed at helping the training of military officers who will in the future be appointed to the various localities in Manchuria and Mongolia, and also to enlighten the spirit of friendship between China and Japan. Thus, it may be expected that unfortunate incidents like the Chengchiatun case will not occur again and that the root of trouble may be exterminated Permanently. However, it is not proper for the Imperial Government to insist upon this matter since it concerns the military affairs of the Chinese Government, and should, therefore, be left to the discretion of the Chinese Government.

Reply by China

Peking, the 12th day of the 1st month of the
6th year of the Republic of China.

The Chinese Minister of Foreign Affairs has the honour to acknowledge the receipt of the Japanese Minister's Note Verbale of January 5th, stating that:

(Japanese Note repeated)

The Minister of Foreign Affairs has to state that hitherto the military cadets school has employed only officers of the national army as instructors and there is at present no intention of employing any foreigner.

Note Verbale from Japan to China

In an aide memoire handed by the Japanese Minister to (Dr.) Chen, the late Minister of Foreign Affairs, on October 18, 1916, it was stated that in consequence of the operation of the Treaty respecting South Manchuria and Eastern Inner Mongolia the Japanese subjects travelling and residing at those places will increase in number and the Imperial Government, with a view to controlling and protecting those Japanese subjects, consider it necessary to increase the establishment of police stations, of which the Chinese Minister of Foreign Affairs is already aware.

The Imperial Government consider that the said demand, in the event of its withdrawal, will expose the Japanese subjects visiting and residing at those places to danger, thus causing trouble and giving rise to serious complications with Chinese officials and citizens.

Inasmuch as it is the duty of the Imperial Government to protect Japanese subjects and its right to control them, not only it cannot view such occurrences with indifference but, in view of the friendly relations of the two nations, it also deems it its duty to take precautionary measures.

As the stationing of Japanese police officers is but a carollary of the right of extra-territoriality, not to speak of the fact that it does not in the least prejudice Chinese sovereignty, it will help improve the relations of the officials and people of the two countries and bring about the development of economic interests to no small degree.

Therefore the Imperial Government is convinced that the Chinese Government will, without doubt, give its consent and the Imperial Government has to add that while the Chinese Government is making up its mind and withholding its consent the Imperial Government will nevertheless be constrained to carry it into effect in case of necessity.

Dated the fifth day of the first month of the Sixth year of Taisho.

Reply by China

Peking, the 12th day of the 1st month of
the 6th year of the Republic of China.

The Minister of Foreign Affairs has the honour to acknowledge the receipt of the Japanese Minister's Note Verbale of January 5, stating that:

(Japanese note repeated)

In reply the Minister of Foreign Affairs has to state that:

Whereas by virtue of the New Chino-Japanese Treaty "Japanese subjects shall be free to reside and travel in South Manchuria and to engage in business and manufacture of any kind whatsoever" and the Japanese and Chinese may jointly undertake agricultural enterprises and industries incidental thereto in Eastern Inner Mongolia, the Chinese Government, in anticipation of the gradual increase in number of the Japanese subjects, therefore caused to be stipulated in Article 5 of the said Treaty that the Japanese subjects in South Manchuria and Eastern Inner Mongolia shall submit to the Chinese police laws and ordinances, so as to enable the Chinese police to effectively discharge the functions of protection and control.

Since the reason in support of the Japanese proposal to station police officers was with a view to protect and control Japanese subjects, but as there are already treaty provisions there is no necessity to station Japanese police officers so as to avoid conflict with the Chinese police rights.

As the seven principal functions of the Japanese police officers, detailed in the aide memoire of October 18, last, are those either which should properly belong to the Chinese police, those which are provided for by the existing treaties or those which are the duties of the constables (marshals) of consular courts, there is no necessity for the establishment of a Japanese police force, hence the question of police cannot be associated with extra-territoriality and the Chinese Government cannot recognize it as a corollary (of the right of extra-territoriality.) Ever since the conclusion of extra-territoriality treaties between China and the foreign Powers for several decades, no such claim has ever been heard.

Although the Japanese Minister has repeatedly declared that the said police would not interfere with Chinese local administration and police rights yet after serious consideration by the Chinese Government the stationing of foreign police within the confines of Chinese territory, no matter under whatever circumstances, is prejudicial to the spirit and form of Chinese sovereignty, tending to cause misunderstanding on the part of the people, thus placing an impediment to the friendship of the two nations.

As regards the Japanese police stations already established the Chinese Government and the local authorities have repeatedly lodged their protests and have not accorded their recognition, nor is the Chinese Government able to admit the reasons for the stationing of Japanese police officers as stated in the note Verbale.

This matter has no connection with the Chengchiatun case, and at the conferences the Japanese Minister has repeatedly expressed the desire to detach it from the Chengchiatun case. The Chinese Government considers it necessary to request the Japanese Government to abandon the matter. At the same time, it is not to be construed as meaning that the Chinese Government has recognised any action to carry the matter into effect.

Note by Japan to China

Peking, the 22nd day of the 1st Month
of the 6th year of Taisho.

I have the honour to inform Your Excellency that with regard to the Chengchiatun Affair for the settlement of which several conferences have been held between me and the Chinese Ministry of Foreign Affairs prior to Your Excellency's assumption of office. The articles set forth hereunder have been mutually agreed upon and, with the exception of such modifications and alterations to the phraseology, as have been considered, no further negotiation is possible. I, therefore, take this opportunity to submit the same to Your Excellency's consideration, and to request that a reply to that effect will be given.

1. The General Commanding the 28th Division to be reproved.

2. The Chinese military officers responsible for this incident to be punished according to law. If the law provides for severe punishment, it will be inflicted.

3. An official proclamation to be issued in the districts where there is mixed residence for the information of the soldiers and the people in general, to the effect that Japanese soldiers and subjects shall be accorded considerate treatment.

4. The Tuchun of Fengtien Province to express, in an appropriate way, his regret to the Governor of Kwantung and the Japanese Consul-General in Mukden, when they are together at Port Arthur, but the method of this expression is left to the discretion of the said Tuchun.

5. A solatium of $500 is to be given to the Japanese merchant, Yoshimoto.

I avail, etc.

Reply by China

Peking, the 22nd day of the 1st month of
the 6th year of the Republic of China.

I have the honour to acknowledge the receipt of Your Excellency's note of to-day, stating.

(Here follows the Japanese Minister's Note)

In reply I have to state that I have taken note of the above articles which I find are contained in the minutes of the several Conferences and the records of this Ministry.

I avail, etc.

Reply

Peking, the 22nd day of the 1st month of
the 6th year of the Republic of China.

With regard to the Japanese soldiers despatched by the Japanese Government and stationed between Ssupingkei and Chengchiatun, I have the honour to inquire of Your Excellency as to the date when they will commence to be withdrawn and also the date when the withdrawal will be completed.

I shall be obliged by a reply setting forth the above details.

I avail, etc.

Reply

Peking, the 22nd day of the 1st month
of the 6th year of Taisho.

I have the honour to acknowledge the receipt of Your Excellency's note of to-day, asking for the withdrawal of the Japanese soldiers stationed between Ssupingkai and Chengchiatun. The Imperial Government of Japan is of opinion that the entire additional forces sent to be stationed at the said places in consequence of the occurrence of the Chengchiatun affair will be withdrawn as soon as the whole arrangement embodied in the five articles which were agreed upon at the Chengchiatun negotiations, has been carried out.

I avail, etc.

MEMORANDUM ON THE REFORM OF THE LAND TAX SYSTEM IN CHINA

[By W. F. Willoughby, Deputy Legal Adviser to the Chinese Government]

Continued from the November issue

Part III.—Preparation of the Tax Rolls: 1. Introductory Remarks. 2. Form of the Tax Rolls. 3. Use of Tax Rolls for Statistical and Control Purposes.

Part IV.—The Collection of Taxes: 1. Introductory Remarks. 2. Organization of a Collection Force. 3. Preparation of Tax Bills or Receipts. 4. Collection of Taxes by the Collectors of Taxes. 5. Monthly Report by Collectors of Taxes of Taxes Collected. 6. Deposit of Collections in Local Banks. 7. Tax payers' Accounts in the Central Office. 8. Collectors' Accounts in the Central Office. 9. Inspection of Offices of Collectors of Taxes. 10. The Bonding of Tax Collectors. 11. Criminal Prosecution of Defaulting Collectors. 12. Recapitulation of Means for Safeguarding the Treasury. 13. Proceedings for the Enforcement of the Payment of Taxes. 14. Premiums for Prompt Payment and Penalties for Delayed Payment of Taxes. 15. Use of Collectors of Land Taxes for other Purposes. 16. Payment of Salaries and Expenses of Collectors. 17. Conclusion: Adaptation of the System Described to China.

PART III

Preparation of the Tax Rolls

Introductory Remarks:—With the work of making an assessment of lands, and the hearing and adjudication of all complaints arising out of such work, completed, the next step in the installation of the system consists in the preparation in the central office of what are known as tax rolls. By tax rolls is meant the formal official document giving the results of the assessment and of the amount of taxes called for by such assessment. We have just seen that the original data regarding assessments are contained in thousands of separate files of documents, there being one file of documents for each piece of land assessed. These documents, however, give only the results of the assessment work. In order that this information may be utilized it is necessary that it be transcribed upon large sheets, and that there be entered upon such sheets the amount of the tax called for by each assessment. These sheets when thus filled in are technically known as the tax rolls. When completed they should be securely bound in volumes and bear a certificate to be signed by the Minister of Finance, and possible other authorities, that they constitute the tax rolls for the year or years to which they relate. They thus constitute the formal statement of the amount of taxes due and the authorization for the proper officials to proceed to their collection.

Form of the Tax Rolls:—On these sheets a single line is devoted to each piece of land. These lines should be numbered and the corresponding number be placed on the file of documents containing the original assessment data. The tax-rolls can thus be used as the means for readily finding the original paper from which the data were taken as occasion requires. The sheets in addition to containing these lines running across the sheets, also contain vertical lines running from the top to the bottom of the sheets thus dividing the lines into blocks or sections in which are to be entered the data regarding the several properties. The data which should be entered regarding each piece of land should include the following: (1) the serial number as above described; (2) the map designation or other means made use of for identifying the particular pieces of land; (3) the character of the land, as for example "pasture land," "forest land," "wheat land," etc., (4) the area; (5) the value per unit of measurement; (6) the total value; (7) the name of the owner or occupier and (8) the amount of the tax due.

Other data which must be given but need not be stated for each piece of land separately are: (1) the province, district and subdivision of the district in which the lands are located; (2) the rate of taxation and (3) the year or years to which the tax rolls relate. This information can be given at the head of each sheet or on an introductory page to each volume containing the sheets for a given district or province. In filling in the tax rolls the properties should, as has been stated, be grouped according to political divisions. There will thus be one or more volumes for each division and it will be sufficient to indicate such division, the tax rate and the year but once for each volume. The amount of the taxes due will of course be obtained by applying the rate of taxation determined upon to the total assessed value of each piece of land.

Use of Tax Rolls for Statistical and Control Purposes:—It is evident that with tax rolls prepared in this way the government is put in possession of information that is of enormous value for statistical and control purposes. Provision should be made at the bottom of each sheet for the totalling of the figures contained in each column and a recapitulation of these totals should be entered upon special sheets. These totals will show not only the total area and value of lands assessed for taxation but the distribution of these totals according to political subdivision and character of lands within each such subdivision. From these figures can be obtained the average value of each kind of land and of all lands for each political division and for the country as a whole.

From the administration standpoint the greatest value of this information will consist in the fact that it will show precisely the amount of taxes that should be collected from each district, and establish the means by which a perfect control can be exercised over the person charged with the duty of collecting these taxes. The central government will thus know not merely the income it can count upon, due allowance, of course, being made for the fact that all taxes due will not be always collected or at least not collected promptly, but the amount of taxes that should be collected by each official. Especial pains will be taken to indicate how this control over the collection of taxes can be made more complete, and assurance had that every dollar collected by them will be duly turned into the treasury, or otherwise accounted for, in our consideration of the problem of providing for the collection of taxes upon which we now enter.

PART IV

The Collection of Taxes

Introductory Remarks:—We have now reached the point where it is supposed that the government has done these things. It has secured a complete list and description of all lands subject to taxation, or at least a list which is as complete as is physically possible; it has had all of these lands separately valued; it has determined the rate of taxation that it will apply to this valuation; it has calculated the amount of tax that should be paid on account of each piece of land as determined by such valuation and rate of taxation; and it has set forth the results of all these operations in a formal and duly certified and signed statement known as the tax-rolls of the country.

Having thus definitely determined the amount of taxes that should be paid by land it is now in a position to take the necessary steps for the collection of the taxes so found to be due. The problem here presented is that of organizing a service for the collection of taxes that will do the following things: (1) it will ensure that the amount of tax due on account of each piece of land will be paid; (2) that no payment in addition to this amount shall be demanded of the tax payer; (3) that all monies collected on account of taxes shall be fully accounted for by the persons making the collection and be paid without any deduction into the public treasury. A proper system is thus one which fully protects both the tax payer and the government, and ensures that the collection officials will discharge their duties with absolute honesty and fidelity.

It may seem that this is an ideal which it is almost impossible to attain. This is not so. This problem had to be met in Porto Rico when the new system of taxing property was introduced after the American occupation and it was met in such a way as to meet these requirements in every respect. It is our intention to describe this system since it constitutes one which, in our opinion, is fully adapted to meet the conditions prevailing in China.

Organization of a Collection Force:—For the collection of taxes the Island was divided into collection districts, and a collector of taxes was appointed for each. These districts were of varying importance, ranging from ones having but a small population to ones embracing cities of considerable size. The districts were grouped in eight classes according to their importance and the compensation of collectors was graded to correspond, running from $480 per annum for the districts in class VIII to $3,000 per annum for the districts in class I. The purpose of this classification and grading of salaries was not merely to make the compensation correspond to the importance of the position but to establish a hierarchy of positions that would make possible the progressive promotion of persons in the service as merit was shown by them. The object arrived at was to make the service one which a person might adopt as a career in which he could win advancement through diligence and faithfulness in the discharge of his duties.

To this end the following principles were adopted and rigidly adhered to. The first was that the service should be absolutely divorced from all political or personal influence and be placed upon a purely merit basis. Tenure of office was permanent, or, to speak more correctly, during good behaviour. Once in the service, a man knew that he could continue there so long as he performed his duties properly. More than that he knew that he could win promotion as he showed merit.

The second was that entrance in the service took place at the bottom; that all original appointments of collectors were to class VIII, and that all vacancies in the upper grades were filled by promotion from among collectors in the class immediately below. The result of this system was that a vacancy occurring in one of the higher grades would give rise to a whole series of promotions until the lowest grade was reached. In making a selection of the particular collector in a given class to be promoted the determining factors were efficiency and seniority, that is, length of service in that grade. Of these two the former was given the greater weight. When it happened, as was often the case, that there was no great difference between the members of a class as regards this factor, the promotion, as was only just, was given to the official who had served the longest in that grade. It is not sufficient, however, merely to establish in principle a system of promotion according to merit. If the system is to give good results two things must be done: means must be provided by which the promoting authority may judge of the relative efficiency of employees and the employees must be made to feel that through such means their superiors are keeping close track of the manner in which they perform their duties. Nothing is more disheartening to good employees than to feel that if they do good work no advantage will result to them since their superiors will know nothing of it; nor more demoralizing to bad employees than the knowledge that a failure on their part to perform their duties properly will not be noticed. Great care was therefore taken to establish and maintain a system of records and reports through which knowledge was always available regarding the manner in which each collector was performing his work.

This information was secured in several ways. In the first place, the central office, through the system of monthly reports to it of collections made during the preceding month, a system which will be described hereafter, was kept currently informed regarding the extent to which each collector was enforcing the payment of taxes in his district. In the second place, the central office had attached two travelling inspectors, whose duty it was to travel from office to office and make an investigation and report upon conditions there found to exist. In addition to inspecting the offices proper these inspectors were required to embody in their reports any information coming to their attention, through complaints of taxpayers or others, regarding the manner in which the collectors were conducting themselves. If complaint was made against a collector or the report of the inspector showed misconduct or lack of due diligence, the matter was brought to the attention of the collector in order that he might take such reply or explanation as he saw fit, the principle being firmly established that no person should be penalized without a full opportunity to be heard in his own defence. In the central office a personal file or record was kept for each collector in which these data, together with his record of appointment, promotions, etc., were entered.

All of these principles and practices, it will be seen, had as their purpose and result to bring into existence a strong continuing incentive to good work and a correspondingly powerful deterrent to misconduct. Each collector had a great stake at issue. If honest and efficient he had a secure position for life with full opportunity for advancement; if dishonest or inefficient he not only would receive no promotion but would be dismissed from the service and thus his career forever ruined. Desirable as is the presence of such principles in any service they are specially necessary in a service having for its purpose the collection of taxes. It is imperative that the collectors should be removed as far as possible from all pressure to favor particular individuals, or fear of consequences if they rigidly enforce the law. This independence can only be secured when the service is taken wholly outside of the influence of politics, is made permanent and advancement given or determined by merit.

Preparation of Tax Bills or Receipts:—From a consideration of the force that was organized for the collection of taxes we now turn to the procedure employed by these officials in discharging their duties. The fundamental feature of this procedure consisted in the preparation in the central office of tax bills, or tax receipts as they were more usually called, representing the taxes to be paid by each piece of land listed, and the placing of these bills in the hands of the collectors for collection. These bills were prepared from the tax rolls. The work required was little more than that of copying the data contained on the tax rolls. A separate tax bill was made out for each piece of land listed. All the data contained on the tax rolls did not of course have to be copied on the tax receipts. All that was required was that the tax receipt should show the property to which it related, the total assessed value, and the total amount of taxes due. The printed or engraved part of the receipt showed the province and district in which the property was located and the year to which the tax payment related. These receipts were attached to stubs upon which were entered the same data as were contained on the receipt. The receipts and stubs bore the same serial number or were given to the entries corresponding on the tax rolls and to the original assessment sheets.

All of the tax receipts with the stubs attached for a district were bound in a volume or volumes. The amount of taxes called for by these receipts manifestly had to correspond both in detail and as regards the total for a district with the tax rolls. When completed these volumes of tax bills were placed in the hands of the collectors for collection. When this was done an account was opened in the central office with each collector and he was charged in this account with the total amount of the tax bills so placed in his hands for collection, the same as if he had that amount of money placed in his possession.

Collection of Taxes by the Collectors of Taxes:—We have seen that each collector is furnished with the bills calling for the payment of taxes due on lands situated in his district. It then becomes his duty to collect the amounts so shown to be due as expeditiously as possible. As payment is made the corresponding tax bill and stub are signed by him as being paid and the date of payment entered in the place provided for such entry on the bill and stub. The receipt is surrendered to the tax payer as his evidence of the payment, the stub constituting the record of the collector. In addition to this record the collector is required to enter the payments in the order in which they are made upon a form provided for this purpose. The entries upon this form thus show the collections made each day.

We have pointed out that in theory it is the duty of each tax payer, without solicitation, to come forward and pay the taxes against his property. Every care was therefore taken, through the publication of notices in the press and the posting of notices throughout the district, to call to the attention of tax payers this obligation vested upon them and the penalties they would suffer if this obligation was not discharged. In starting this system it was found desirable to go beyond this and to direct the collectors of taxes to do what they could in the way of calling this matter to the attention of individual tax payers through personal and written communication. To not a little extent success during the first year or two in collecting taxes was due to the energy and tact with which this duty was performed by the individual collectors.

Monthly Report by Collectors of Taxes of Taxes Collected:—We have seen that the collectors of taxes were required to keep a current record of collections made. Once a month, or in some cases at more frequent intervals, the collectors were required to transmit to the central office, on a form provided for that purpose, a statement of all taxes collected during the month or other period of time, and at the same time to account for the money so collected.

Deposit of Collections in Local Banks:—In Porto Rico an account of moneys collected was rendered in the following manner. In each city or town in which a collector was located a bank or other financial establishment was made a depositary of public funds. The collectors were required to deposit the moneys collected by them with these establishments and the receipts of such deposits signed by such establishment were transmitted by the collectors with their reports of collections of taxes. The money was deposited to the credit of the treasury and was, of course, subject to call at any time by the government, and the banks paid a fair rate of interest to the government for the use of the money pending its call by the government. This system not only obviated the expense and risk involved in transmitting money collected but also relieved the government from the necessity of itself sending money to the district to meet local obligations, as all such obligations could be discharged by drafts drawn on such depositaries. The government, of course, took due precaution that the money so deposited would be safe by requiring from the banks so designated as depositaries fidelity bonds and requiring from them reports of moneys so received and paid out.

This system is not a necessary feature of the system of collecting taxes but it is mentioned as a feature which in Porto Rico gave excellent results and might with benefit be introduced, at least in places, in China.

Taxpayers' Accounts in the Central Office:—The monthly reports of the collectors of taxes of their collections and deposits gave to the central office the means of keeping an exact account with each piece of property and each collector of taxes so that the central office knew at any moment how the account of each such property or collector stood with the government. Following the preparation of the tax rolls and tax receipts an account was opened up with each piece of property represented by these documents. Each year this account was charged with the tax assessed against it. When the monthly reports from collectors were received they were turned over to the bookkeepers who proceeded to credit the accounts of the properties represented by the entries contained in such reports. It will be noted that though new tax rolls had to be made out each year the account with the properties was a continuing one. The office thus knew the total amount due by each piece of property and the years to which such amount related.

This record served a number of important purposes. Although the persons making the payment of taxes were given receipts in evidence of such payments these receipts were often lost. As the taxes assessed against properties constituted a first lien against them it was imperative that the government should have an official record of such lien. Persons desiring to purchase land or to loan money on land could not do so with security unless they could know how the account of the lan stood with the government. In return for a small fee th central office would issue a certificate giving this informatio It thus became the rule that persons would not purchase land o loan money upon land until they had been furnished with such certificate by the existing owner or borrower.

Much the most important use of the record, however, wa the complete check it gave the central office over the collectors Through it the central office could see whether the collector were collecting the amounts called for. It also revealed th extent to which the collectors were failing to collect taxes upo particular properties.

Collectors' Accounts in the Central Office:—Mention has bee made that at the time the collectors are given the tax receipts accounts are opened with them and that they are charged wit the total of the receipts so placed in their hands for collection. The second purpose served by the monthly report of collections and deposits in banks is that of enabling the central office t know how this account is running from month to month. As the monthly statements of taxes collected and moneys deposited are received the collectors are given credit for the total amounts represented. It is through these accounts that the central office maintains an absolute control over the collectors and ensures itself that all moneys collected are duly accounted for. It is evident that at any time the difference between the total charge against a collector and the sum of the deposits of collection made by him constitutes the balance for which the latter must account. This balance he accounts for by the production on demand of: (1) the uncollected receipts still attached to their stubs and (2) cash on hand representing collections made and not yet deposited.

Inspection of Offices of Collectors of Taxes:—If accountability is to be secured in this way it is manifest that a system must be organized for the frequent examination of the books of the collectors for the purpose of ensuring that the balances standing against the collectors can in fact be accounted for. Such a system was provided in Porto Rico by the establishment of an inspection service consisting of examiners whose duty it was to travel from office to office, total the amount of unpaid tax bills and of cash on hand and see if the sum thus arrived at corresponded to the balances standing against the collectors on the books of the central office.

It is hardly necessary to state that these examiners should be men of the highest integrity. In order to lessen the danger that they might act in collusion with dishonest collectors, the inspectors did not follow their own judgment in selecting offices for inspection. They proceeded upon orders given to them by the central office. A collector thus never knew which inspector would make an inspection of his office, nor the time at which such inspection would be made. At times officers or employees of the central office, not members of the inspection force, were detailed to make special inspection, thus further lessening the dangers of collusion between the collectors and the persons making the inspection.

The Bonding of the Tax Collectors:—As a further protective against loss through dishonesty each collector, before entering upon the duties of his office, was required to furnish a bond guaranteeing that a full accounting would be made by him of all moneys collected. If, in spite of all the precautions that we have mentioned, there was a failure on the part of any collecto to account for all moneys coming into his hands, the governmen could call upon the bondsmen or bonding company to make good the loss. This requirement of a bond also meant that no perso could be appointed a collector until he had found a responsible company or men of wealth and position who were willing to vouch for his honesty. No person or company would take this risk until they had satisfied themselves that the person to be bonded was honest and reliable. The government thus secured an additional guarantee that only honest persons would be appointed to this responsible office.

Criminal Prosecution of Defaulting Collectors:—Another principle that was rigidly enforced was that all collectors failing to account for moneys coming into their hands should be proceeded against criminally. The collectors were made to feel that it was impossible for them to conceal any dishonesty for any length of time and that as soon as their dishonesty was discovered they would be immediately arrested and prosecuted to the full extent of the law.

Recapitulation of Means for Safeguarding the Treasury:—The foregoing will, it is believed, show that in Porto Rico every possible care and safeguard was adopted to ensure that every cent collected by the collectors of taxes would be accounted for and that the public treasury would actually receive the full amount collected. The writer had the experience of administering this system during the first six years that it was in operation and he can vouch for the fact that in practice it gave all the results that could be expected of it. An honest and efficient corps of collectors, recruited exclusively from among the natives of the Island, was secured and retained and the government suffered practically no loss. There is no reason to believe that, if the same steps are taken in China, equally favorable results cannot be obtained.

Proceedings for the Enforcement of the Payment of Taxes:—An important feature of any tax is the system that is made use of for enforcement. Generally speaking two systems may be employed for this purpose: that of proceeding against the person by whom the tax should be paid; and that of proceeding against the property taxed. If the former of these two systems is adopted the tax payer can be proceeded against both criminally and civilly; that is, his failure to pay the taxes due from him may be treated as a crime or misdemeanor or the attempt may be made to realize the amount of taxes due by taking any property belonging to him. If the second method is adopted no attention is paid to the tax payer. The tax is simply treated as a first lien upon the property taxed and the state as the possessor of this lien proceeds to attach and sell this property whenever the conditions of the lien are not met.

This principle of proceeding against the property to enforce payment of delinquent taxes constitutes, in the opinion of the writer, one of the great advantages of the principle of taxing land rather than the landowner. In proceeding under this system several different practices may be followed. The one usually employed in the United States is as follows. The law provides that the taxes are due and payable upon a certain date, say January of each year. If not paid during the following three or six months, or by April 1 or July 1 they are deemed to be "delinquent" A list is then made and published for a certain number of days in one or more newspapers of all lands upon which the taxes are delinquent. Accompanying this list is a notice that if the taxes are not paid before a certain date the government will proceed to sell such lands at public auction. Notice is thus given to the owners of land to come forward and protect their properties by the payment of the taxes due.

In Porto Rico a somewhat different system was divised. Owing to the fact that the majority of the population could not read or write and that notices appearing in newspapers were certain in large part to escape their attention, it was decided to attempt as far as possible to notify each landowner of record individually that if he did not appear and pay the taxes due on the land specified by a certain date, the collector would sell such land at his office at public auction. At the same time notice of such sale was given to the public by the posting of lists of lands to be sold in conspicuous places. Special forms were provided for notifying the delinquent landowners.

The adoption of this plan was a part of the general policy of sparing no pains, during the period that the system was being established, to bring home to the taxpayers the character of the system and of giving to them every possible opportunity to protect their interests. With the system once firmly established the method of general publication and general auction at one time of all lands upon which the taxes are delinquent is probably preferable to the Porto Rican system of individual notification and special sales of particular pieces of land on certain specified dates.

Under the system as practised in Porto Rico the collectors were required to make a report of all lands sold, the purchase price, etc. The sale of each piece of land was reported on a separate form provided for the purpose. By having these reports made on separate sheets it was possible to keep all the records and papers in the central office relating to each piece of land together so that they could be readily consulted. When the price paid for the land by the purchaser was in excess of the amount of the tax and all surcharges due, the balance was turned over to the owner of the property and his receipt was taken and attached to the report.

Equity of Redemption:—In Porto Rico and in the United States generally the system is followed of not giving at once a deed to the purchasers of land at tax sales. All that they are given on making payment for the properties bid in by them is a certificate of sale which provides that if the owner of the property does not appear within a certain period, say six months, and repay the purchaser his purchase payment plus a heavy interest charge a clear deed will be issued to them. Pending this period the original owner remains in possession of the land. This provision which is technically known as an "Equity of Redemption" is made in order to give a still further opportunity to the owner to come forward and protest his property. It is not an essential feature of the system. Its main benefit consists in meeting those cases where, through inadvertence, absence from the country, sickness or other reason land has been sold without the knowledge of the owner.

Premiums for Prompt Payment and Penalties for Delayed Payment of Taxes:—Another means almost invariably employed to secure prompt payment of taxes is that of placing a premium upon the prompt payment or a penalty for non-payment of taxes when due. This is done by providing that if the tax is paid when due a reduction of a certain percentage, say 5, or 10, percent will be made, or by providing that if the tax is not paid when due a penalty of a certain percentage, usually one percent for each month of delinquency, will be added to the tax. Of these two means of inducing prompt payment, the latter is much preferable. We have seen that the tax bills are made out for certain fixed amounts and that the collectors are charged with and compelled to account for such amounts. This system of holding collectors to account for the bills placed in their hands for collection would be seriously interfered with if reductions from these amounts were permitted. The system of imposing penalties is moreover preferable from the standpoint of the government since it means an addition instead of a deduction from the income to be obtained from the tax.

The imposition of a penalty for delinquency is justifiable not only as a means of securing prompt payment but also as a means of compensating the government for the trouble and expense to which it is put in enforcing payment of delinquent taxes.

The collectors are required to account for moneys collected in the way of penalty charges in this way. The daily record of tax payments which they are required to keep and the monthly report which they are required to render shows the date on which each payment is made. In columns provided for that purpose are entered: (1) the amount of the tax; (2) the amount of penalty or surcharge and (3) the total payment. The central office can thus verify whether the proper surcharge has been collected or not. It is true that the possibility exists that collectors may enter payments as made of earlier dates than the ones on which they were actually made. If reports are secured at frequent intervals and the inspectors perform their duties properly the chance of fraud in this way can be reduced to very slight proportions. In Porto Rico little or no trouble was encountered in respect to this matter.

Use of Collectors of Land Taxes for Other Purposes:—Thus far we have proceeded under the assumption that the work of collecting the land taxes would be entrusted to a special force of officials to be known as Collectors of Taxes. The writer has no doubt but that this policy is far preferable to that of having their work entrusted to other provincial officials. It is imperative that the collection force constitute one strongly integrated body of officials under the direct and exclusive control of the central tax office at Peking. In this way only can an *esprit de corps* be developed, and the advantage attaching to the filling of superior positions by promotion be secured.

While it is thus highly undesirable that the work of collecting taxes should be entrusted to other officials there is no objection to duties other than those of collecting the land tax being entrusted to the special service of collectors provided these duties have to do with the collection of public revenues. On the contrary there is a strong argument in favor of having these officials charged with the collection of taxes of all kinds in their respective districts. This was the policy that was pursued in Porto Rico. Especially were the collectors made the officials for the sale of revenue stamps, the use of which was required by the Excise tax system of the Island. If they are entrusted with the collection of public dues other than the land taxes, special provision must, of course, be made for exercising over them a rigid control through the requirement of the keeping of records, the rendering of accounts, etc., such as is suggested in reference to their work as collectors of the land tax.

The advantages of concentrating all the tax-collecting work in the hands of one set of officials consists in the economy secured by keeping down the number of officials and offices that have to be provided for; in the possibility that is presented of paying higher to such limited number of officials and in thus securing and retaining a higher class of persons for these positions; in lessening the expense of inspection, since one force of inspectors can cover all the duties of the collection force; and, generally, in obtaining all those benefits which accrue from concentrating authority and responsibility as narrowly as possible.

Payment of Salaries and Expenses of Collectors:—A fundamental feature of the system for ensuring that a full accounting shall be had from collectors of taxes for all moneys collected by them is that all moneys collected by them shall be turned in to the central government or deposited to its credit in local banks. No deductions for salaries, expenses or other purposes should be permitted. This means that the central government shall make provision for the payment of the salaries and expenses of the collectors. This is necessary, not only in order to secure a full accountability for all receipts, but to enable the central office to exercise a rigid control over expenditures of all kinds.

It is hardly necessary to point out that if the system is to be made to work an adequate scale of salaries must be established. The collectors must be made to feel that they are being properly compensated for their work. No ground must be allowed to exist for any claim on the part of the collectors that the compensation is so inadequate that they are compelled to add to their salaries through improper means. Especially must the tax payers be made to appreciate that no payment under any guise can be demanded of them except that of the amount of the money called for by the official tax bills. In view of past conditions in China no pains should be spared in making the tax payers know their rights. In no small part the success of the system will depend upon the extent to which success is achieved in doing this.

In like manner the central office should carefully determine just what are the needs of each collector in respect to an office, office expenses, and clerical assistance. No person except the regularly authorized employees should be permitted to take any part in the administration of the system. All such employees should be appointed by the central office, though this appointment may be made on the nomination and recommendation of the collectors. Like the collectors they should receive adequate salaries which should be definitely fixed and be paid by the central government. Any attempt on their part to secure from taxpayers any further compensation should be proceeded against with the utmost severity. On of the duties of the inspectors should be that of reporting upon financial needs of each office visited. By checking one office against another the central office can determine very closely what provision should be made for the clerical help and general expenses of the several offices.

Conclusion: Adaptation of the System Described to China:—Though no attempt in this Memorandum has been made to describe conditions in China or the special problems that have here to be met, the writer has had these conditions and problems constantly in mind throughout his work. He has tried to familiarize himself with these conditions and problems in as far as his limited stay in the country has permitted. He recognizes that the attempt to reform the existing system of taxing land is a monumental undertaking. He is persuaded, however, that the undertaking is one that can be carried through if the decision is once made to do so and the work is resolutely pushed.

Notwithstanding the small size of Porto Rico in comparison with China, and the corresponding greater ease of installing a new system, the problem in its fundamental aspects is not dissimilar in the two countries. The main difference between the two countries is that in China the country will have to be sub-divided for assessment and taxation purposes to a greater extent than was the case in Porto Rico. Reference in this Memorandum has constantly been made to the duties and functions of the "Central Office." In Porto Rico there was but one such office, that located at the capital, San Juan. In China it may be desirable to decentralize the system by having a central office for such province or possibly for each of certain major subdivisions of the larger and more populous ones. If this is done it is highly desirable that there should be a superior office at Peking exercising a general control over the whole system through the central offices of the provinces. This superior should at least extend its control far enough to ensure that identical principles, methods and forms are employed throughout the country.

Another departure from the Porto Rican system that may be desirable is that, instead of having the work of assessment and installation of the new system cover the whole country at once, it be undertaken in one province at a time, a choice for this purpose being made of the province or district in which the work can be prosecuted under the most favorable auspices. A selection might thus be made of the province of Chihli or the metropolitan district of Peking as the area in which to inaugurate the work.

Before concluding this Memorandum there are one or two general considerations regarding which the writer would like to say a few words. The first of them is the desirability of using every possible means of informing the public regarding the proposed plan, its necessity and advantages. Especially should it be pointed out that the plan is not one to increase but to decrease the burden under which the taxpayer now rests. It should be made clear to the people that, though the government is to secure a far greater income from the reformed system it will do so by ensuring that all moneys paid by the tax payers will be covered into the treasury and not by requiring of them payments in excess of those they are now making. Another feature of the proposed plan that should be dwelt upon is that under it taxes will be more equitably distributed and more honestly administered. Especially should the fact be brought home to the tax payers that they will have a protection against arbitrary exactions and vexatious supplementary demands that they do not now enjoy.

The point that the writer has in mind, in making the foregoing observations, is that, as far as possible, public sentiment be organized in support of the change. To this end the writer suggests that it might be well to have prepared a Memoir along the lines of the present Memorandum to which the widest possible publicity should be given through the press and its distribution in pamphlet form. A further means of contributing to this end would be that of inviting comments and suggestions on the part of public bodies and officials regarding the proposed plan. If the position could be attained where the plan had the substantial endorsement of the country as expressed through these means its execution would be enormously facilitated.

A final suggestion along this line is that the actual undertaking of the work be authorized by formal law enacted by the Li Fa Yuan which is shortly to come into existence. The writer knows of no more important matter to be brought before this body for immediate consideration. An enactment of a great revenue law would be a great achievement to stand to the credit of this body. With its adoption by this body the situation would be that where the people themselves, acting through their legal representatives, had reached a determination to put their financial system upon a sounder basis. With such a prestige and authority back of the new system, opposition by the people would be largely forestalled, and the hands of the officials would be greatly strengthened in putting through what, at best, will be a task of the first magnitude.

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CHINA AND HER ADVISERS

The splendid returns of China's only organized revenue-producing departments—the Maritime Customs and the Salt Administration—during the year just ended naturally enough directed special public attention to the lack of organization in other directions, and several newspapers have already asked why China does not take fuller advantage of the services of the numerous advisers she already pays in order that some efficiency may be obtained in all financial and administrative departments. The answer, regrettably enough, is a very simple one. China will take advantage of nothing progressive unless it is forced upon her. The organization effected in the Maritime Customs and the Salt Administration was not of China's volition. The original suggestion to put those services under the control of foreigners met with strong opposition. When the salt revenue in particular came to be considered as security for the Reorganization Loan the effort to have it reorganized in order to produce efficiency was resisted stoutly by the interested Chinese officials, and even when the Bankers succeeded in securing consent to this scheme not only were the Chinese reluctant to co-operate, but in foreign circles there was quite an amount of scepticism and considerable scoffing at the hardihood of those who appeared really to believe that reform and reorganization were possible. Within the brief period of three years, however, there has been such a startling change effected that the Jeremiahs have been put to shame and the Salt Administration has virtually kept the country from bankruptcy during the past twelve months. Not only has it netted the magnificent total revenue of $97,104,793 but after meeting obligations the Government has been able to secure for its own purposes some $52,226,185 an unbelievable possibility three years ago! And this with a handful of foreigners. Yet, left to herself China would not only not have reformed the administration herself but she certainly would never have gone so far in the pursuit of honest administration as to have employed an expert such as Sir Richard Dane. As it happens she was compelled, in order to secure the loan for which she so hungered, to accept reorganization, and more particularly was she constrained to swallow her "lose face" pleas and bestow liberal powers upon the foreign expert. Be it said to the credit of some progressive Chinese, however, that they welcomed this departure, and it was the hearty co-operation of the first co-director, Mr. Chang Hu, with Sir Richard that made early progress in extirpating unpardonable maladministration rapid and marked.

One does not necessarily have one's back bent under fardels of pessimism because one draws attention to this characteristic of the conservative Chinese. The evils of centuries cannot be uprooted in a day, but the uprooting movement is afoot and at this period it is probably much more beneficial to China constructively to criticize than sloppily to panegyrize. If the iron once enters China's soul it is certain that she will never cease in her activities till she comes into her own. But the lethargy of China has been of such lengthy duration that the dissipation of it appears to many as almost a hopeless possibility. Many of the foreign advisers now paid, but not employed, by China, have in their time been filled with the ambition to aid in the regeneration of the nation, and most of the many have taken the flattering unction to their souls at one time or another that they have been singularly and individually fortunate in having been blessed with a Heaven-sent opportunity to exercise their talent and their time in accomplishing what others before them have dismally failed to do. Each in his turn, however, has been compelled to drink of the cup of bitterness, and some to the uttermost dregs, and where once dreams of great achievements buoyed them to their several tasks they now move leaden-footed through months of disillusionment, idle and unhappy. China has broken many capable gentlemen on the wheel, has alienated many powerful friends, and has managed by crass stupidity deplorably to degrade what should have been a distinctly honourable title. To be an Adviser in China at the moment is by no means to be the occupant of an enviable position: With the exception of the Adviser to the Salt Administration, who is possessed of executive powers, no other Adviser can enforce his suggestions, or translate them into deeds. Nor can any one of them bring the pressure to bear which seems necessary to compel consideration of memoranda indited purely to prevent the government from making errors puerile in themselves but fraught with grave consequences to the nation. There are among the Advisers conscientious men who have striven consistently to justify their appointment—men who have not shirked the responsibility of plainly illustrating to the Government the weaknesses from which it suffers. Memoranda have been submitted on many occasions which if acted upon would have saved the country much humiliation and considerable financial loss, but for some unexplained reason they have just as consistently been pigeon-holed and continue to be pigeon-holed, *toties quoties*. Nor is it ever possible to extract from the Chinese any acceptable reason for the constant disregard of counsel which is even based on specific information and dealing with subjects of a concrete and immediately vital nature. When Chinese whom it is pardonable to believe are progressive are appealed to for some explanation of the callous disregard by conservative officials of advice and Advisers the result is as a rule extremely unsatisfactory, and the questioner is solemnly assured that "When the Cabinet is changed" a change will likewise come o'er the spirit of the doleful dream, the discouraged Adviser will then be accorded the status which should be his, and unto him will come at last the experience of seeing his counsel appreciated and accepted. This is a promise which has become threadbare. When the revolution was afoot to oust the Manchus the world was assured that once the effete race was removed from power a veritable millenarian transmogrification would ensue. The revolution was finally successful in February, 1912, but the only change signallised was, according to unsympathetic critics, for the worse. Then the plea was employed that the late Yuan Shih-kai was to blame. Several attempts were made to oust him, but on June 6, 1915, a higher power than Chinese revolutionists effected his removal, since which time conditions have become not a whit the better. Now the clamour is that nothing can be done until General Tuan Chi-jui is deprived of power, and after he goes what then? Surely a continuous conflict between the political factions, if recent events are to be accepted as a criterion. And through this period of practical chaos strides the riant pseudo-reformer destroying and forgetting to construct, tilting at anyone who risks the hazard of forming a government and cheerfully exhorting all questioners startled by the gradual progress of the country towards the precipice of national servitude to wait and have faith, and still more faith. To counteract this devil-take-the-hindmost spirit which seems to be abroad in the land it would be in the best interests of China if all her well-wishers would continue to emphasise that callous indifference to national affairs at this time when the world is plunged in blood will surely lead to disaster to the nation. Now is the time when all Chinese should be united if they never were before, not only as to patriotism but particularly as to policy. The mightiest intellects that China can herself provide or secure elsewhere are not too great to avert danger to her independence, nor should any ordinary brain be too small to employ in this cause. With the distant knell of doom sounding in her ears it behooves her to hasten to bury her internal strife, to marshal her best men, her advisers and her friends, and pray that they will with singleness of purpose, employ themselves in her behalf, she guaranteeing at the same time to co-operate and institute the reforms so sorely needed to put her on a level even with the smallest organized State enjoying recognition in the comity of nations. The first step in this direction should be the provision of means to enable the Advisers now so liberally paid, and all only too anxious to serve, to utilise their knowledge, their experience, and their zeal for reform in the interests of China. Given this, and given the whole-hearted backing of united officialdom, and China need no longer hang her head in shame, a potential giant among the nations but at the present time, as in the past, virtually a hopeless outcast, lethargic, impotent and scorned.

BRIGANDS, CARPETS AND PERFUMES

An obscure paragraph in recent Shanghai newspapers stated that brigands had attacked the town of Kuan hsien in Szechuen province, implying that the roads were not safe beyond that gateway to northwestern Szechuen and Tibet. Few foreigners care to travel that road even in times of peace and the statement regarding the brigands probably excited no comment in the mind of the general run of readers. Yet it has a bearing on commerce in one of the world's great staples and one of its luxuries as well, so that a word regarding this region that lies at the back of the remotest vestige of civilization may not come amiss.

When the suave salesman deftly unrolls lengths of carpet in the department stores of the United States and tells the would be purchaser that carpets are much higher "due to the war," he might also add "and the brigands at Kuan hsien." For two seasons now the brigands have infested the route that leads through the great irrigation gateway made by the "First Gentleman of China" into the gorges of the Min River or Fu-ho, and up its rocky defiles to Sungpan, one of the world's largest original wool markets. Here at Sungpan, the Chinese wool buyers gather twice a year in July and November to receive the products of the sheep that roam the hills habited by aborigines, the Mantsu, who for two thousand years and more have acted as a buffer nation against the Chinese who might wish to exploit the timber and minerals of the eastern mountains of Tibet.

The normal output of wool from Sungpan, that is in times of low prices, is close to a million taels in value, and while this is scarcely a tenth part of the wool export of China, yet the Szechuen sundried as it is called in the trade has its certain definite uses in the manufacture of carpets, so that the lack of it is felt in those mills that are accustomed to weave it into floor coverings. Practically no wool has come down from Sungpan since the revolution to overthrow Yuan Shih-k'ai was started in November, 1915. Three seasons' clip is therefore withheld from commerce or perhaps still roaming the hills on the backs of the aboriginal sheep, since the Mantsu probably would prefer not to gather a crop that he cannot sell.

Not only the carpet maker, but the perfumer as well is interested in this minor news item regarding Kuan hsien, for Sungpan is one of the largest primary markets for musk. Here are brought the little pods of rank odor that grow on the male deer at the rutting season, and each of the pods costs the life of a buck whose flesh, travelers say, is of indifferent value for food. These deer roam the high mountains of Tibet and 80 percent of China's output of close to a million taels comes through Sungpan, the other large market being Tengyueh near the border of Burma. While artificial musk is a well known article of chemical manufacture, yet it cannot replace the real musk in the manufacture of high grade perfumes. The artificial musk indeed has the odor of musk, but it lacks the one quality for which it is indispensible in the mind of the maker of the finest essences and toilet waters. The musk from the musk deer is used as a "fixitive," perfumers say, because it seems to render more permanent the more fugitive odors that are used to give the distinctive note to their finest products. Perhaps it really serves only as a background, the rough canvas on which the perfumer portrays his odor-images, but be that as it may, he wants the real musk since it and civet are the two great animal perfumes that enter into the composition of almost all of his finer products.

Even in times of peaceful commerce, it is no easy matter to get the wool and musk, the hides and sheep skins, the Chinese medicinal plants and other minor articles that form the sources of aboriginal revenue from Sungpan to Chungking. The Min River defies even the most skilled Chinese boatmen and they are a hardy class that go swirling through rapids that rival those of Niagara without a qualm, visibly at least. Sungpan is some 2,500 meters above the level of the great Szechuen plain at Chengtu and the route is one succession of precipitous passes through a country that has been recommended to tourists who have tired of climbing the milder slopes of the Swiss Alps, and to artists that have grown jaded over the gentle fiords of Norway, although the brigands probably prefer to keep the scenery to themselves just now, so that the journey is not to be seriously recommended until China has opened the road again. The journey down stream takes ten days for those traveling light, while the coolies that bring in the wool take nearly three weeks to make the 235 miles.

Therefore it would seem that even a band of brigands on the border of Szechuen can disturb commerce sufficiently to raise the price of carpets and give a less lasting tone to milady's perfume. But it will not be long now before Western Szechuen is gathered again under the hand of the military governor and the traffic in wool and musk will be resumed. Then when the two years' store of these commodities is released, prices ought to be lower, for the wool at least. Whether this will also affect the price of carpets, the form in which the wool appeals more strongly to the consumer, is another question. As for the price of perfumes, it depends on other factors than the cost of raw materials so that while the quality may resume its former fragrance, the outlay of the purchaser doubtless will be just the same, when the last Kuan hsien bandit is decapitated.

CHINA'S RAILWAYS IN 1916

The complete returns of China's railways for the year 1916 have not yet been made available, but we are able to give the earnings of the most important lines. It is satisfactory to note that the sum total is an increase over the working of the previous year, though it is disappointing to see the Peking-Mukden line, one of the principal earners, showing a decrease. That the Tientsin-Pukow line shows an increase is encouraging, though there is wide ground for complaint with regard to the scandalous manner in which traffic is conducted. Not that this is the fault of the railway authorities. It is due chiefly to the military chiefs installed at Hsuchowfu and Pengpu. These brilliant generals regard the railway as their private property and abuse it to the utmost. Fares of officers and men are not paid, and freight traffic is upset by them. Continual abuses are witnessed by travellers on the line—abuses which the railway people are completely powerless to prevent—and despite the fact that most trains are filled both with passengers and freight, still the line does not pay. It is certain, however, that if the Government could remove the ban of military control and place the management in competent hands the line would at once spring to the position of being one of the chief earning factors in the system. The Peking-Hankow railway still takes the blue ribbon for results, the increase over the previous year being the substantial one of over three million dollars. Though it is not yet recorded it may be stated that the Shanghai-Nanking railway also came out well, the line showing a profit on working for pretty well the first time since its establishment. The following returns are so far available:

Name of Railways	Revenue of 4th year of the Republic	Revenue of 5th year of the Republic	Comparison with 4th year	
			Increase	Decrease
Peking-Hankow	17,141,095.00	20,150,000.00	3,008,905.00	
Peking-Mukden	15,277,931.00	14,362,296.00		915,635.00
Tientsin-Pukow	8,529,038.00	9,492,348.00	963,310.00	
Chengting-Taiyuan...	2,073.000.00	2,154,000.00	81,000.00	
Taokow-Chinghua ...	633,400.00	827,100.00	193,700.00	
Canton-Kowloon ...	835,485.00	788,763.00		46,722.00
Peking-Suiyuan	3,613,494.00	3,960,300 00	346,806.00	
Chuchou Pingshang..	677,435.00	738,545.00	61,110.00	
Shanghai-Nanking	Report not yet in but it is understood that the revenue of these lines all show considerable increase over former years.			
Sh.-H.-Ningpo				
Kirin-Changchun				
Kwangchou-Sansui				
Changchow-Amoy				
Total	48,780,878.00	52,473,352.00	4,654,831.00	962,357.00
		Net Increase	3,692,474.00	

CHINESE SALT REVENUE FOR 1916

In our last issue we gave the approximate returns of salt revenue for the year 1916. We are now able to give the final totals which show that the revenue paid into the Group Banks during the year amounted to $72,440,559.89, which, added to the amount in the Banks at the beginning of the year, and plus interest earned during the year, made a grand total of $97,104,793.48. From this amount the Government was able to receive for its own purposes the handsome sum of $52,226,185.48, money made available to it when it was in direct straits, and without which it would have found it difficult to escape bankruptcy. And despite the fact that the Government was able to receive such liberal assistance the whole of the obligations on the salt revenue were paid and at the end of the year there still remained in the Banks the sum of $19,543,804.67. In appreciation of this splendid result we hear that the Government paid a highly deserved bonus to Sir Richard Dane, and we expect to hear very shortly that the Government has also set aside a bonus for distribution amongst the staff who have assisted to produce the result. The figures are as follow:

Balance in Group Banks on January 1, 1916....	$24,385,191.22
Revenue paid into Group Banks during 1916......	72,440,559.89
Interest, etc., received during 1916................	279,042.37
	$97,104,793.48
Charges and obligations:	
Boxer Indemnity..........................	$10,071,371.07
Chihli Provincial Bonds of 1910..................	725,973.90
Hupeh Provincial Bonds of 1909..................	150,509.78
Chinese Govt. 5% (Crisp) Loan, 1912............	2,383,368.74
Chinese Govt. Reorganization Loan, 1913........	11,580,681.91
	$24,911,905.40
Miscellaneous withdrawals........................	47,727.66
Releases to the Central Govt. during 1916........	52,226,185.48
Transfer charges and losses by exchange............	375,170.27
Balance with group banks on Dec. 31, 1916......	19,543,804.67
	$97,104,793.48

JAPANESE TO INSPECT EXPORTS

Japanese newspapers state that there has been considerable criticism, both by importers in various parts of the world and by Japanese consuls, concerning the inferior quality of Japanese manufactures. Both consuls and trade organizations claim that although, owing to conditions created by the war, the country has an exceptional opportunity to supply the markets of the Orient, the South Seas, and Russia with innumerable articles formerly sold by the belligerent countries of Europe, the local manufacturers and exporters are throwing away this opportunity by supplying goods of inferior quality.

These complaints are largely regarding goods from Kobe and Osaka and both the local authorities and the Japanese Government are attempting measures designed to improve the quality of goods exported by means of official inspection. Japanese newspapers state the Osaka Prefecture has already instituted an official inspection of certain goods destined for export, among them being soap, glassware, and underwear. Other articles are to be added later as the inspection system is extended. The manufacturers of enamel ware in the Prefecture objected to the inspection, however, on the grounds that it would place them at a disadvantage unless the wares manufactured in other Prefectures also were inspected. The objection demonstrated the necessity for a more universal inspection, and the Commercial and Industrial Bureau of the Department of Agriculture and Commerce of the National Government now is compiling regulations intended to prevent the exportation of goods of inferior quality. The method proposed is the appointment of official inspectors to be attached to every trade guild, all goods being submitted to their inspection before exportation. All the guilds with the single exception of that in the glassware industry express their approval of the proposed measure.

THE PORT OF PUKOW

Improvement Bureau Making Plans for Action

Steps that are now being taken by the Military Governor of Kiangsu Province, who is also the Vice-President of the Republic of China, would seem to indicate that the port of Pukow, the Yangtsze River terminus of the railway from Tientsin, is at last about to be developed and metamorphosed from a marsh into a modern settlement.

Pukow has waited an unconscionable time for this glory to be thrust upon it, and so far has lived down in its reeds and mud all the promises of improvement that were so lavishly made some years ago by officials who obviously have forgotten their classics and particularly have overlooked the gentle admonitory reminder in the Analects that " the reason why the ancients did not readily give utterance to their words was because they feared lest their deeds should not come up to them. "

No such delicate consideration seems so far to have disturbed the bulk of the twentieth century survivors of the makers of the Grand Canal and the Great Wall. On the other hand, unhappily, they give rein to their tongues without trepidation and seldom emulate the Superior Man by " exceeding in their actions," the result being that China is as far behind the world as it was when Emperor Shitsu provided through transport from the south by digging the "Imperial River,'' or when Shih Hwangti chain-ganged his hordes to erect his "ten thousand li rampart."

That a change is now coming, however, is sincerely to be hoped. There are indications that are encouraging, and insofar as the possibility of Pukow rising to the dignity of a modern commercial port is concerned the fact that General Feng Kuo-chang and Mr. Wen Tsung-yao are the Director-General and Co-Director-General respectively is an augury not to be overlooked. Mr. Wen, who will have charge of the active execution of the plans, is well-known for his tireless energy, his fearlessness against official lethargy, and his indomitable will, and if he fails to make dreams materialise at Pukow no one else can succeed at this time. He can be counted upon to drag Pukow out of the swamps unless the war or internal political struggles or some other combination of circumstances over which he has no control frustrates him.

Mr. Wen Tsung-yao

But for the fact that what is now practically a through line from Shanghai to Peking connects at the Yangtsze River at Nanking (on the south bank) and Pukow (on the opposite northern bank) the latter place would be unknown to the world. This terminus of the Tientsin-Pukow railroad is built up where once the reeds of the marshland swayed supreme and where the principal life was that of the wild duck and the goose, myriads of which abound on the great brown river flowing by.

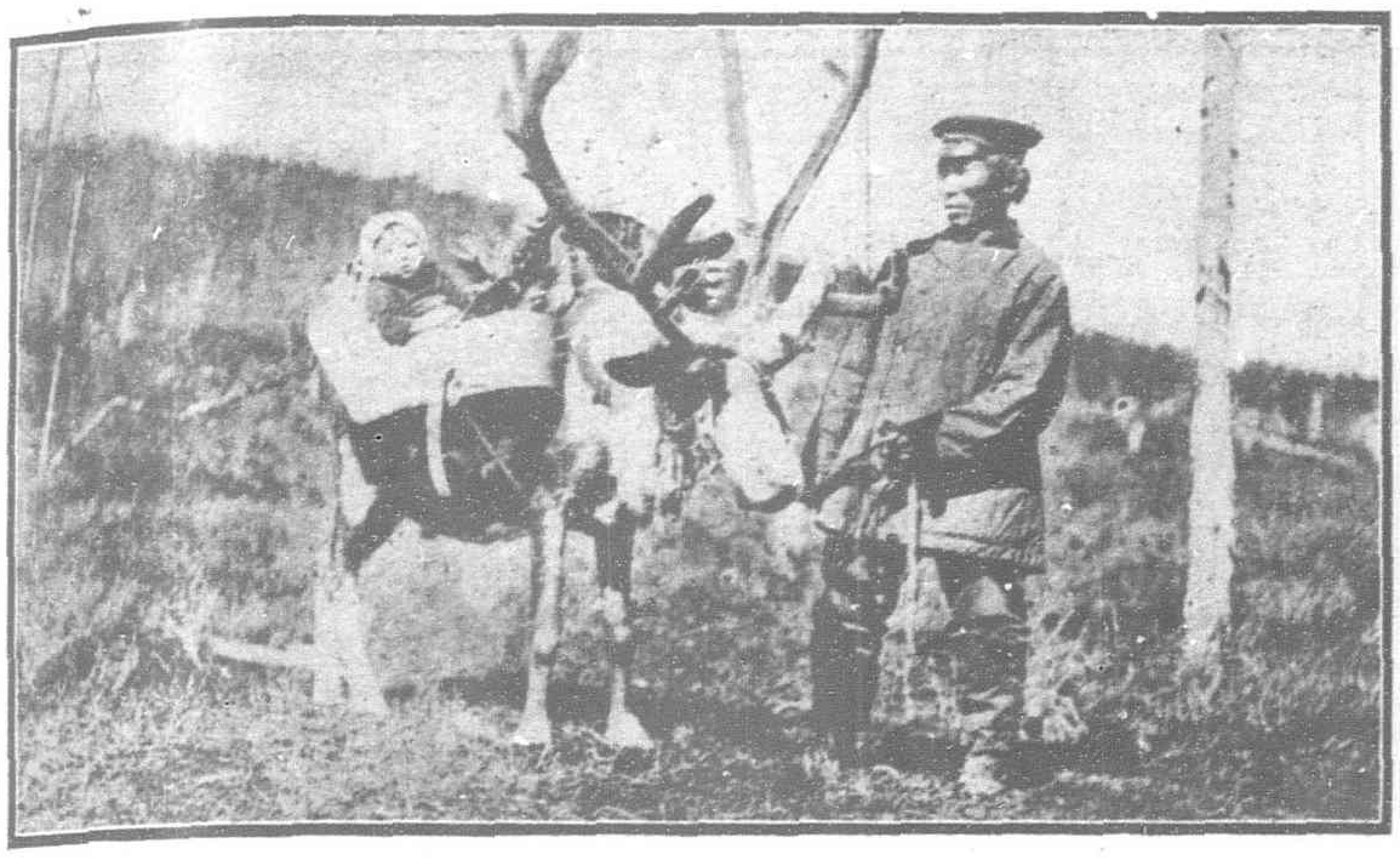
The 30,000 mow of land, or rather, bog, which will be covered by the new city was originally held by people who never for a moment believed it would ever be of value. When the railway development made it certain that a terminus would be established opposite Nanking the landowners were approached by farsighted compatriots and gladly enough they parted with drear land for what was to them a high price but what in reality was a comparatively low one. The new owners, having an eye to business, naturally enough took a keen interest in the development of the port and after some negotiation presented to the Government, the Manchus then being on the Throne, a block of 1500 mow on condition that the Government would build a bund along the river front. A movement for the establishment of a port then being under way the Government appointed Shen Ping-kun as Director-General of the Commercial Bureau for the Development of the Port of Pukow. Shen's qualifications for the post were that he knew nothing at all about modern cities or commercial requirements, but he once was acting-Viceroy of Yunnan, and Governor of Kwangsi Province. Before he could take up office, however, he died suddenly in Peking. Chang Yung-kwan, ex-Tutuh of Kiangsu, who ultimately became chief censor under Yuan Shih-kai's republican system, was appointed to the vacancy, and during this period, while Mr. Hsiung Hsih-ling was Premier and Minister of Finance, a loan was negotiated for the purpose of building the port and doing other things elsewhere. The loan was signed with the Banque Industrielle de Chine on October 9, 1913, for Francs 150,000,000, and out of that sum Francs 100,000,000 were issued in Paris in April, 1914, the proceeds to be devoted to the construction of Pukow port, the construction of the tramways in Peking, etc.

Very soon after the loan was signed, and before any work was done, Chang Yung-kwan resigned as Director-general and was appointed Chief Censor. He was succeeded by Liu En-yuen, who managed to incur the enmity of the landowners, and on charges of corruption he was sued at Peking. The Ministry of Commerce, Agriculture and Industry appointed General Feng Kuo-chang to investigate the charges, and he reported in support of them. Liu was naturally dismissed, and after the office had remained vacant for some time the Government decided at the request of the land-owners to make General Feng Kuo-chang, then Governor of Kiangsu with headquarters at Nanking, the Director-General and Mr. Wen Tsung-yao, Co-Director General. Mr Wen assumed office last month and is already arranging for work to be proceeded with.

Several plans for a city were drawn up but it is likely that one submitted by M. Bourgery, Engineer of the Banque Industrielle de Chine, will be adopted. He made his survey in 1914, the outbreak of war interrupting further progress. His plan calls for the building of a city on most modern lines, the main streets radiating from a central point. A sewage system is included, and lungs for the inhabitants in the shape of parks are also provided. Before any city building can be undertaken, however, the whole of the land will have to be filled, and this task Mr. Wen Tsung-yao will now prepare to proceed with. In all probability mud will be pumped from the Yangstze River, a process that should be as economical as it is practical.

KUHARA MINING CO.

At the directors' meetings of the Kuhara Mining Company the disposal of profits amounted to 6,189,000 yen. The dividends were decided at 20 per cent ordinary and 35 per cent special, making a total of 55 per cent. The Company's dividend the previous term was 50 per cent. Of all the large copper smelting companies, this concern is paying the largest dividends. It is rapidly coming to the front, rivaling the Mitsuis and the Mitsubishis.



TYPICAL SIBERIAN NOMAD

CAMP OF NOMADS IN SIBERIA

PRESENT AND PROJECTED RAILWAY DEVELOPMENT OF WESTERN SIBERIA

In western Siberia, which stretches from the Ural Mountains to the section east of the Yenisei River, trade is more or less subject to the influences of European Russia, through which in normal times foreign supplies are imported. The central zone of Siberia, consisting of the territory around Irkutsk, is important chiefly from the point of view of mineral development. The distance from export markets limits the yield of agricultural and other products, and this district does not offer as good prospects for future trade as other sections of the country. The eastern part of Asiatic Russia, beyond Lake Baikal, is generally known as the Russian Far East, and the trade in this territory is a specialized business distinct from that of the rest of the Empire. The bulk of the supplies for this region is imported through Vladivostok.

Western Siberia is the most important section agriculturally and is the most thickly settled. Out of a total population for Siberia of 11,500,000 nearly 9,000,000 are settled on the plains of western Siberia and in the foothills of the Altai. These plains stretch across the continent for almost 1,200 miles without a break to the Altai Mountains and are watered by the great rivers of Siberia—the Ob, the Irtish, and the Yenisei—which flow in a north and south direction to the Arctic Ocean.

The Altai Mountains cross Siberia from southwest to northeast, forming the northwest edge of the great central Asiatic tableland. In the north the plains of western Siberia are covered with a forest belt, rich in unexploited timber and fur-bearing animals, but consisting largely of impassable swamp. South of this forest zone extends between latitudes 55 and 57 the black-earth region of Siberia, the section most attractive for agricultural colonization. Farther to the south are the dry steppes, which are inhabited chiefly by nomadic Tartar tribes with large flocks of cattle, horses, sheep, and goats. In the foothills of the Altai and at higher altitudes there are also excellent agricultural lands and pastures of alpine meadow, including an area of black-earth belt that is probably the richest in Siberia. It has been estimated that the black-earth zone of the western Siberian plains and the foothills of the Altai farther east could, if properly cultivated, support five times the present population of European Russia.

The economic development of western Siberia since the completion of the Trans-Siberian Railway has been notable. During the 10 years preceding the outbreak of the war the emigration to Siberia from European Russia was proceeding at the rate of nearly 300,000 persons per annum. This great influx of people naturally tended to enhance the growth of the riches of the country from year to year. The result was that the surplus of agricultural products available for distribution on the export and European Russian markets greatly increased and before the war had already attained large dimensions. The exports of butter from western Siberia, for example, which began in 1897, amounted in 1913 to over 178,000,000 pounds.

The inadequate transportation facilities have made it possible to ship abroad from Siberia only high-priced products of small bulk, such as butter. Great difficulties have sometimes been experienced in marketing surplus grain and local prices have sunk below cost. The trans-Siberian main line and steamer services on the principal rivers were long the only means of transportation, and settlement was confined to a narrow territory along the railway and the river banks. The development of the agricultural resources of this region, as well as the rich stores of gold, silver, copper, iron, and coal, has been awaiting the construction of branch railway lines.

Railroads Completed

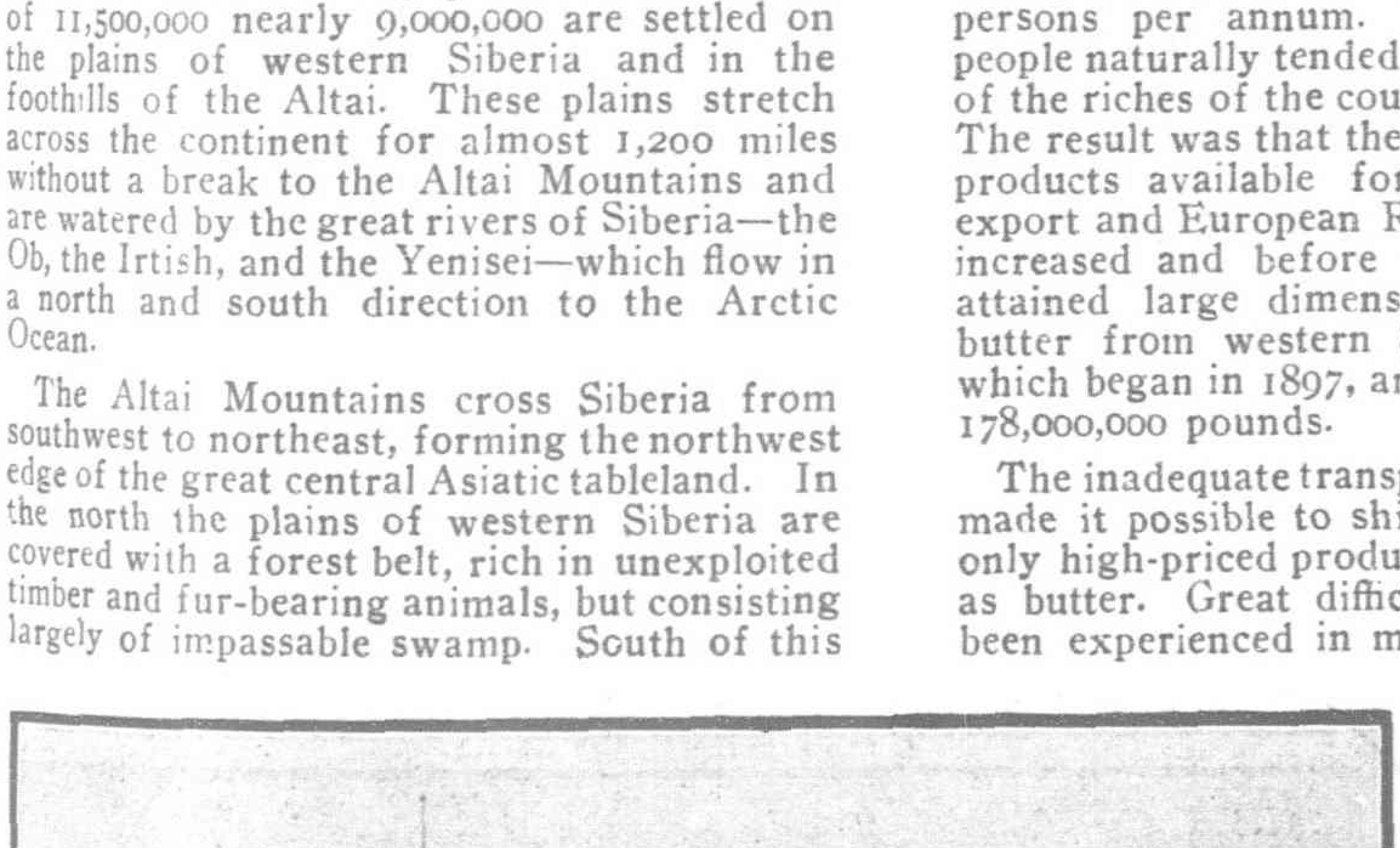
The Tyumen-Omsk line was constructed before the war and the double-tracking of the trans-Siberian has been completed from Omsk to the junction with the Amur Railway. The Amur Railway is built along the border of Russian Territory adjoining Manchuria and, with the Ussuri Railway from Khabarovsk to Vladivostok, provides an all-Russian route to the Pacific as an alternative to the older route from Kuenga eastward over the Chinese Eastern Railway.

During the present year three new important railway lines have been opened for traffic and the construction of a fourth will soon be completed, as follows:

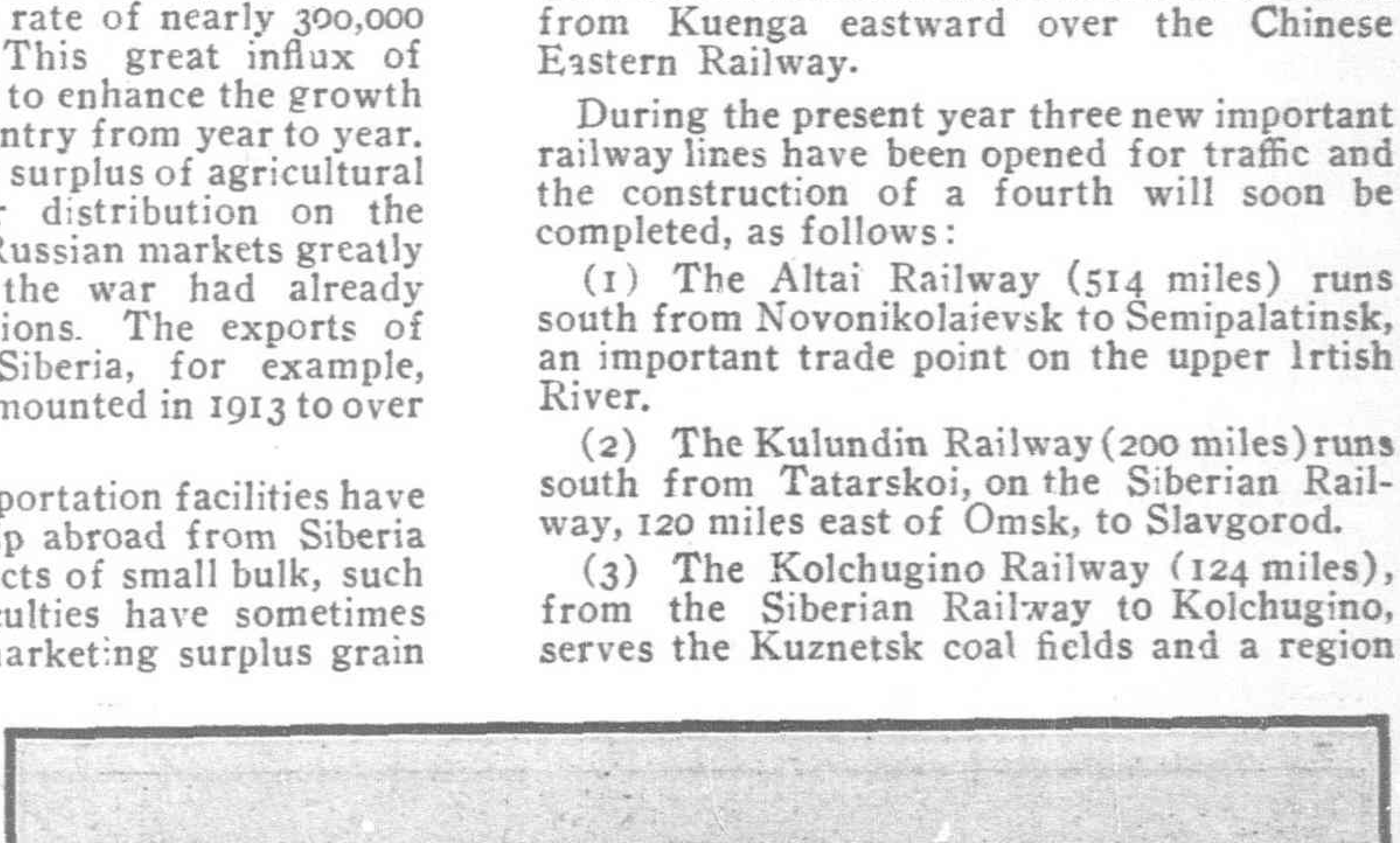
(1) The Altai Railway (514 miles) runs south from Novonikolaievsk to Semipalatinsk, an important trade point on the upper Irtish River.

(2) The Kulundin Railway (200 miles) runs south from Tatarskoi, on the Siberian Railway, 120 miles east of Omsk, to Slavgorod.

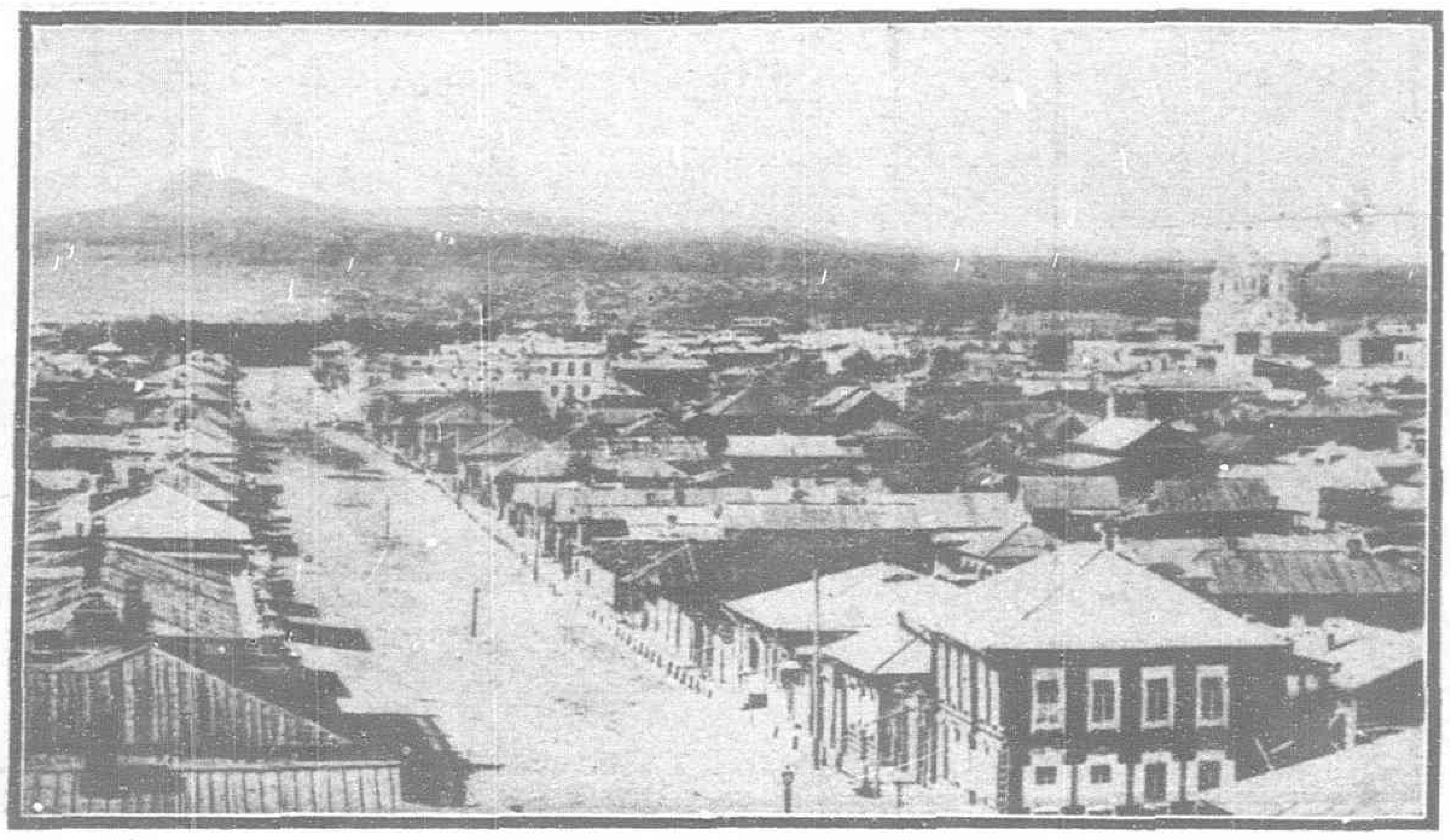
(3) The Kolchugino Railway (124 miles), from the Siberian Railway to Kolchugino, serves the Kuznetsk coal fields and a region



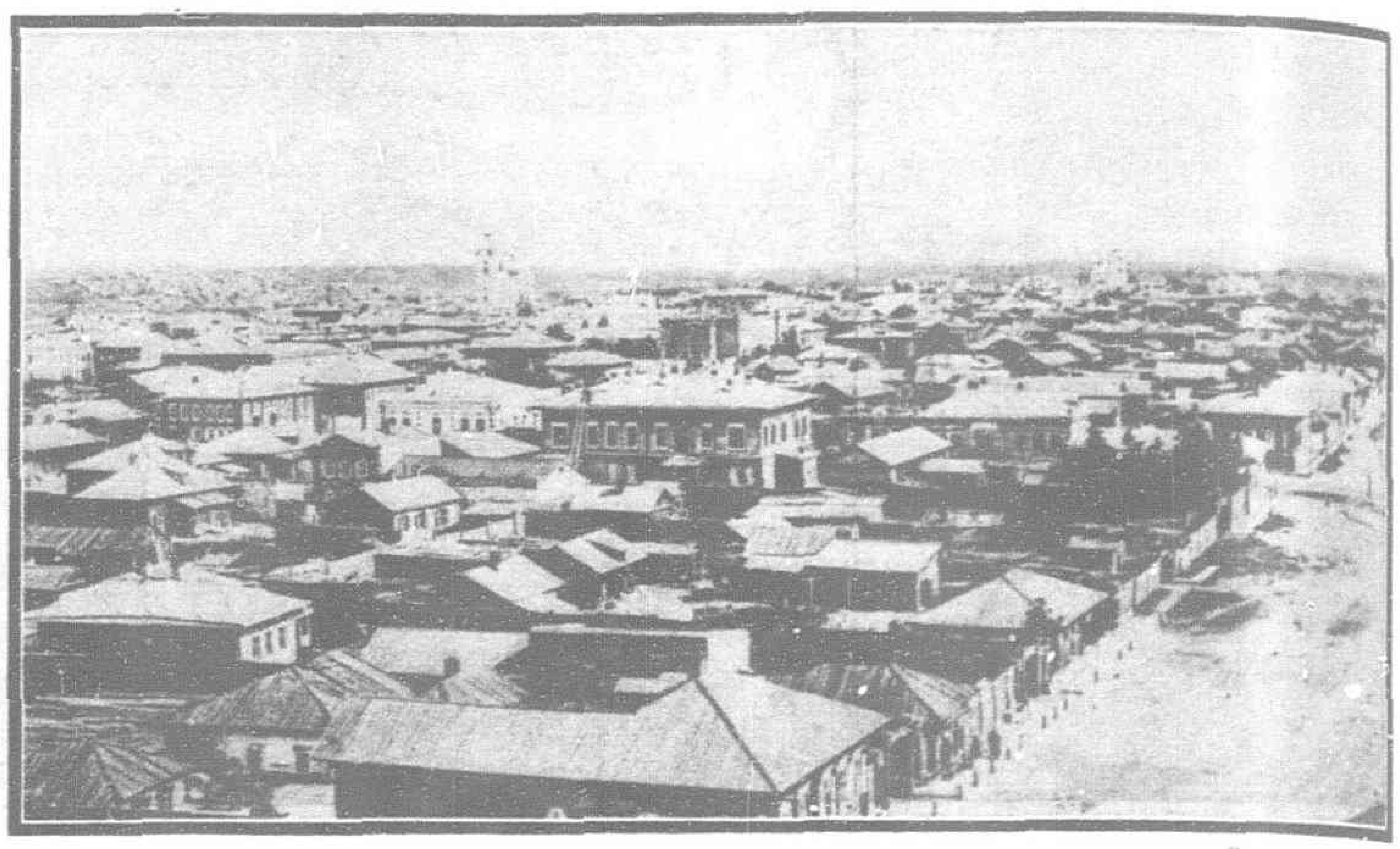
STATION AT ACHINSK, JUNCTION POINT OF NEW BRANCH RAILWAY TO MINUSINSK



VIEW OF ACHINSK



KRASNOYARSK—JUNCTION OF YENESEI RIVER AND TRANS-SIBERIAN RAILWAYS



VIEW OF KRASNOYARSK SHOWING PERMANENT CHARACTER OF BUILDINGS

rich in other minerals. Concessions for 200 miles of other lines have been granted to a private syndicate, which has also obtained authority for establishing a large metallurgical and coke factory near Kuznetsk.

(4) The Minusinsk Railway (276 miles), shortly to be completed, will run south from Achinsk, on the Siberian line, to Minusinsk, on the upper Yenisei River, traversing a region with a fertile soil and valuable deposits of coal and iron.

Railroad Projects for Next Five Years.

The following railroads in Siberia are to be constructed, if possible, by 1922, and at any rate not later than 1927:

(1) The South Siberian line (1,000 miles) will run from Orsk, in Orenburg Government, European Russia, through Akmolinsk to Slavgorod, the present terminus of the Kulundin Railway and Barnaul, where it will connect with the Altai Railway and the Kuznetsk-Barnaul branch of the Kolchugino Railway. It will be extended later to Minusinsk. The railway will provide an outlet for the agricultural products of the Kirghiz Steppes, the upper Irtish and Ob Rivers, and the foothills of the Altai, and for the copper, lead, and zinc of the Semipalatinsk and Akmolinsk districts.

(2) The Akmolinsk-Spassky Copper Mines Railroad will connect the proposed South Siberian trunk line with mineral areas to the south.

(3) The Slavgorod-Semipalatinsk-Verny line (1,000 miles). Verny promises to be the trade center for an extensive district and also the emporium for trade with inner Mongolia. A railway is already being constructed to Verny from the Tashkent Railway in Russian Turkestan. Rail connection with western Siberia should therefore render possible the exchange of Siberian grain and other products for the semitropical products of Turkestan.

(4) The Petropavlovsk-Kokchetav Railroad (100 miles) will run south from the Siberian to Kokchetav.

(5) and (6) The Kolchugino-Kuznetsk-Telebesse and Kuznetsk-Barnaul lines are projected extensions of the Kolchugino Railway.

(7) The Ekaterinburg-Sinarskaya and Shadrinsk-Kurgan lines.

(8) The Achinsk-Yeniseisk Railroad, running north from the Trans-Siberian to Yeniseisk, will seve rich agricultural districts.

(9) The Lena Railway, from the Transsiberian line to the head of navigation on the Lena, in Irkutsk Province, will afford rail connection with the Lena gold fields.

Some of these railroads are to be built by the Government and for others concessions are to be granted to private concerns. It is required that the equipment be purchased, so far as possible, in Russia, but it will be impossible for Russian firms to supply all the materials necessary and a large amount will have to be imported.

Refrigerating Plants and Grain Elevators

Additional cold-storage plants and grain elevators are other essentials to Siberia's development, and plans are being made for their construction. A large refrigerating plant has been constructed by a private concern at Kurgan, but additional facilities are necessary. The Commission on Cold Storage recently held a meeting at Ekaterinburg and decided to submit to the Duma a plan for the establishment of cold-storage plants at central points throughout western Siberia and for the provision of more refrigerator cars on the railways. Several points in western Siberia have also been selected as suitable centers for grain elevators, concessions for which will be granted by the Imperial State Bank.

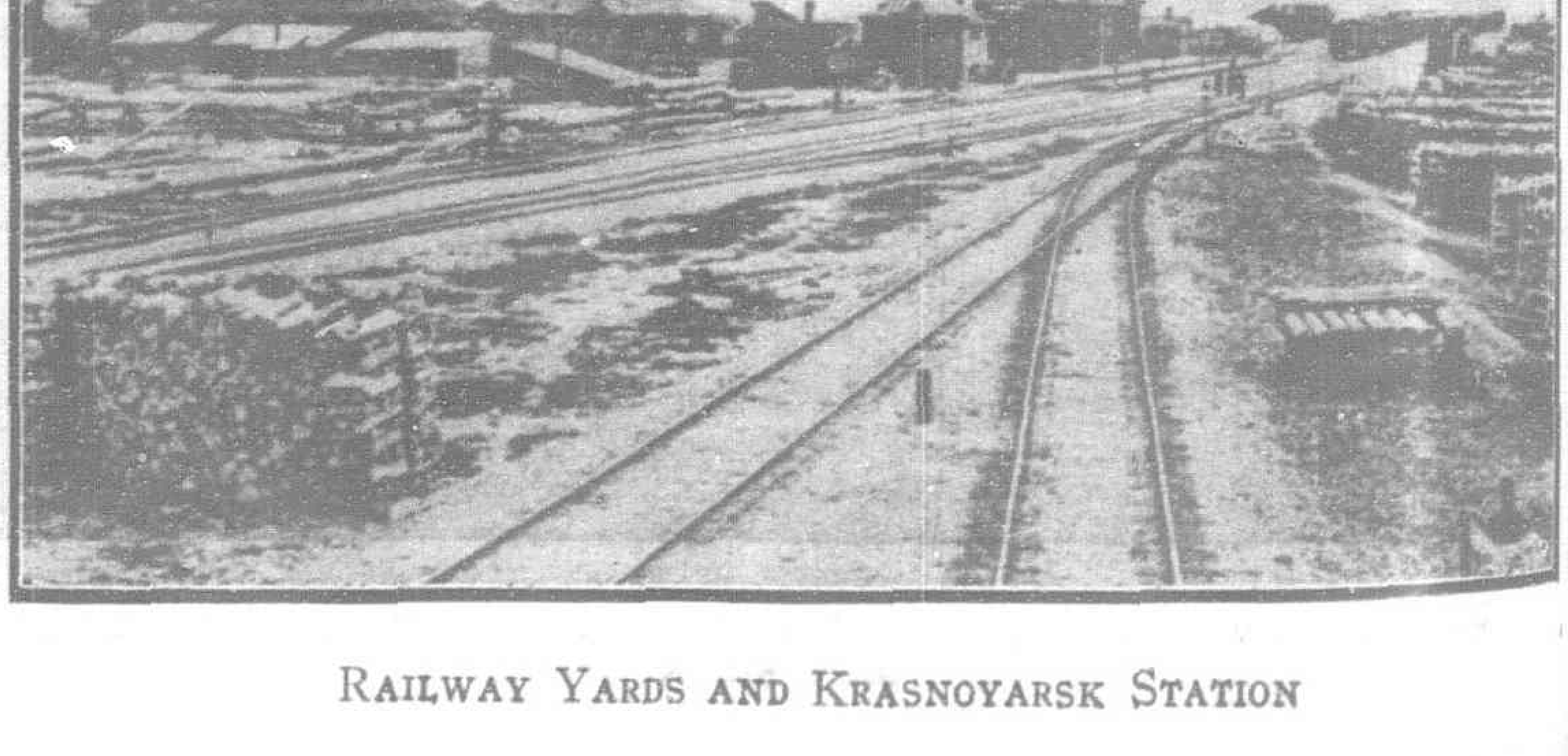
The provision of more adequate transportation facilities will result in more advanced methods of exploiting the country's agricultural, mineral, forest, and fishery resources. The gold yield, it is thought, will be doubled, and the iron and steel industry will yield during the first seven years about 960,000 tons of iron annually. With this development would be established specialized industries catering to the growing demand for manufactured goods, and the equipment for these factories would have to be imported. Western Siberia should offer a growing market for finished manufactures also, which must in most cases be imported.

A large share of the trade of western Siberia is controlled by European Russian houses, which purchase in Moscow the foreign supplies required for their branches in various centers. There is a tendency, however, toward the establishment of strong local independent firms ordering their requirements of foreign goods direct. For most lines of trade a foreign firm is therefore advised to establish an agency for this territory apart from its representation in European Russia.

Stocks of all sorts of imported goods are depleted and prices are very high. A considerable amount of Japanese and Swedish products are being shipped to Siberia. These countries are making every effort to have their goods known and connections established so that their firms shall be in a strong position when normal trade is resumed. The execution of a few trial orders, even if small, under the present difficult cenditions, would go far toward establishing permanent connections.

The following goods may be mentioned as among those for which the demand is great: Tools, builders' hardware, electric-light fittings, enameled ironware, hand pumps, razors, knitted goods, hosiery, handkerchiefs, paper, and stationery. The possibility of supplying machinery and equipment in connection with the following undertakings warrants careful study and, if possible, personal investigation: Construction of railways, grain elevators, refrigerator plants, railway-car shops, flour mills, leather factories, meat-canning factories, ironworks, and coal and other mining equipment.

YENESEI RIVER AT KRASNOYARSK



RAILWAY YARDS AND KRASNOYARSK STATION

DEVELOPMENT OF SZECHUEN

By American Consul M. S. Myers, Chungking

The most striking obstacle to the healthy expansion of the trade of this Province is the absence of adequate and dependable transportation facilities. Szechuan Province is the largest, and reputed to be the richest, of all the Provinces of China, and an enumeration of its products would also probably show them to be the most varied. Many of them are produced in far greater abundance than can be consumed locally, and the production of these and of others as well could readily be expanded were cheap transportation available.

In the absence of any governmental data on the economic conditions of the Province, statements and estimates as to the volume and value of its products may easily prove misleading. However, I quote with a certain degree of confidence the following from the British consul general at Chungking:

Szechuen lies at the very back of China, but its remoteness would be of less consequence were it readily and easily accessible. From a commercial and paying standpoint, through steam navigation of the upper Yangtze can never be realized.

It may be asked, "What does it really matter if the prospect of steam navigation on the upper Yangtze has to be abandoned? Junks will still continue to ply, and trade will go on as before."

It matters much to the Province of Szechuen, which, with its industrious population of 45,000,000, is rich in valuable products, but is unable to get proper value for its money. The Szechuenese are particularly fond of foreign goods of all kinds, but they are debarred from a free indulgence in them by the heavy freights with which they are, under present conditions, necessarily burdened.

In December, 1902, the freight per catty from Ichang to Chungking was 23 cash, that is to say, about £4 a ton. Even £5 is not an unusual freight for this stretch of 400 miles. The foreign resident here has to pay 10 dollars 30 cents for a case of kerosene oil which in Hankow costs only 3 dollars 40 cents, and a 4-pound can of Hongkong cube sugar, worth about 60 cents in Shanghai, can not be had for less than 3 dollars 40 cents. As with these, so with all foreign goods. They are expensive luxuries, which only the rich classes can procure.

The advancement attained in marine-engine construction now enables the Ichang-Chungking section of the river to be navigated by steam with a certain degree of regularity during eight months of the year, but all the dangers to navigation still exist and are attested by the absence of insurance rates and the high freight rates which the steamers demand. These rates are on the average about double the high rates charged for junk transportation, and far higher than the railway rates now obtaining on the railways in China. In fact, these railway rates are even considerably less than the junk rates.

Proposed Ichang-Chungking Railway a Necessity

The solution for the transportation difficulties under which commerce now labors is the proposed railway from Ichang to Chungking. Such a railway would carry nearly all of the present river-borne traffic owing to its superior advantages over river competition in safety, speed, and cheapness. Industrial development of all kinds would be given impetus by the removal of the existing obstruction to transportation of heavy machinery and the products of industrial establishments and mining enterprises.

The opportunities for expansion of American trade which would result from the construction of this line by American capital and ingenuity would be manifold. Some of the richest mining regions of Yunnan are in the drainage area of the Yangtze River, and it is by means of this line that these rich silver, copper, and other mineral deposits may be equipped with modern machinery and their products brought to the markets of the world. Not only will it mean the employment of American engineers and purchase of American railway materials, but its successful completion will do much to impress indelibly upon the minds of these provincials the efficiency of American methods and the high standard of American materials. This, together with the present kindly feeling entertained toward American enterprise, will stimulate the demand for American machinery and mining equipment and American merchandise generally.

It is axiomatic in these days of international finance that trade follows capital. The fact that European capital will be occupied in the rebuilding of Europe after the war for some years to come will give America the opportunity of firmly establishing its commercial relations in this region, provided railway construction and commercial endeavor are jointly and whole-heartedly taken in hand.

Insufficiency of Junk Traffic—Excessive Freight

The importance and the obvious necessity of this line of China can be substantiated by any one of a number of reasons. Conditions that have existed since December, 1915, clearly demonstrate the value of a railway connecting this city, the great commercial emporium of Szechuen, with the lower river, both to Chinese political and commercial interests and to foreign commercial interests. During all this time, owing to the movement of troops up and down river, the transportation of cargo was at a standstill, and this will continue to be so until the autumn, as the high water increases the difficulty and danger to junk traffic to such an extent that transportation at this time is rarely attempted. Although steamers are now resuming their services, their cargo carrying capacity is so small that scarcely an impression will be made on the goods awaiting shipment. Moreover the excessive freight rates charged debar all but the most valuable cargo.

American Enterprise Should Follow the Opening of this Railway

As soon as construction on this railway is commenced American commercial interests should make preparation for reaping the full benefit to be derived from the employment of American capital and from the natural development and increased business which will result from the presence of superior transportation facilities.

American commercial interests would do well to establish connections, and in some cases branches, especially in machinery products, at Chungking, where at least miniature samples may be kept and demonstrations given. It is certain that our wide-awake competitors will be here long before the railway is completed, and if the United States is to obtain its share of the trade equally intelligent and efficient efforts will have to be exerted.

Prominent Chinese often express a desire for closer commercial relations with the United States and a desire to see American firms established in Chungking. This friendly spirit of the Chinese should be cultivated and not allowed to die from disregard and neglect. With the construction of this railway by American capital unlimited commercial possibilities await the initiatory efforts of the American merchant, but unless American endeavor is whole-heartedly and intelligently applied, others will reap the rich harvests engendered by American money and ingenuity.

In addition to the above, efforts also are being made by the American Consul General, Mr. E. S. Cunningham, of Hankow to stir up financiers of the United States to supply funds for the continuance of work on the I-Kwei line that will solve the Yangtze gorges difficulty. He says in a recent report:

American Section—Railway Construction Awaits Funds

The I-Kwei section of the Hukuang lines provided for by the Hukuang loan, is known as the American section, is not being constructed because of want of funds, but by the end of 1915 the survey of this line was made not only to Kweichowfu, but for an extension to Chengtu. It is regretted that American financiers have not provided funds for the construction of the I-Kwei section of the railway. As a financial proposition it is considered sound. The Chinese Government is only waiting for the money to construct the section as a military necessity and a commercial obligation to the hinterland that would be opened up in Szechuen and beyond. It is as fine a business opportunity as exists in China, and but for lack of funds due to the European war this section would have probably been well under way from loans provided from the United States conjointly with other nations. The line will parallel a river which can not be a carrying competitor, and it will open up a country rich in agricultural and mineral resources and having an industrious and frugal population as great as the continental United States in 1900.

A railway is a civilizer and trade producer, because it brings civilization and its markets nearer to the new districts. This section would make possible the development of a Province abundant in natural resources, creating a larger market for foreign products, and making possible sales of native products now out of reach because of lack of transport. It is not expected that there will be great development in railway construction in this consular district until the Chinese Government is able to make additional arrangements for the securing of funds, which, during the continuance of the European war, are only obtainable in the United States. The question remains, Will America avail itself of trade opportunities as great as were ever offered now when competition is merely nominal?

INDIGO IN MADRAS

The Government sowing report on the indigo crop of 1916-17 in the Madras Presidency, just issued, states that owing to the large profits made last year there has been an important increase in the area under indigo in the current year. Good seed has been generally available, although the prices have ruled very high. The total area now reported for the current year is 344,300 acres. The increase is especially noticeable in in Kistna, Guntur, Nellore, and Kurnool, but occurs everywhere. The final forecast report on indigo in 1915-16 placed the area sown in that year in the Madras Presidency at 182,800 acres. Final figures for 1915-16 are not yet to hand for all districts, but it would appear that the area actually cultivated with indigo last year was about 202,000 acres. The season has been generally favorable to the crop so far. On an average of the five years ending 1914-15 the area under indigo in the Madras Presidency has represented 33.4 per cent of the total area under indigo in British India.

HANKOW'S EGG PRODUCTS TRADE*

(BY U. S. CONSUL GENERAL EDWIN S. CUNNINGHAM)

Hankow and its environs is one of the greatest egg-producing regions in China, exporting to Chinese and foreign ports over 10,197,000 pieces of fresh whole eggs, valued at $53,531 (gold), during the year 1915. This is in addition to 12,347,867 pounds of frozen egg exports, valued at $462,716, during the same period and large quantities of eggs used by the natives in local consumption and sold to foreign factories for the manufacture of albumen and other egg products.

Of the hen-egg products exported to Chinese and foreign ports from Hankow, dried albumen is far in excess of the others, totaling during 1915 over 2,207,000 pounds, valued at $737,358 (gold), against 1,365,000 pounds the preceding year, valued at $381,362. Liquid egg yolk is second, with 7,092,000 pounds, valued at $417,363, in 1915, against 6,345,000 pounds, valued at $224,851, in 1914. Dried egg yolk is third, with an exportation of 2,752,000 pounds, valued at $320,592, in 1915, against 697,000 pounds, valued at $60,320, in 1914, followed by liquid albumen with a total of 48,000 pounds, valued at $5,073, against 459,000 pounds, valued at $39,597, during 1914.

There are numerous native egg dealers located in Hankow, who have their agents throughout this section of the country buying up the egg production.

Local foreign albumen factories have contracts with the native dealers for the supply of eggs, which are subject to inspection by the contracting factories. By these agreements the manufacturers are able to purchase eggs somewhat cheaper than the market price and at the same time obtain the best quality by returning all bad or doubtful ones to the dealers.

Eggs are the most plentiful during the spring months. At present the price of fresh eggs is approximately 16,000 cash per picul of 133⅓ pounds. As the average number of eggs per picul is about 1,500, the cost per egg is 10⅔ cash or less than one-half cent United States currency.

Upon the arrival of the eggs at the factory they are subjected to a candle test, then washed and brought into the breaking room, where the yolks and whites are separated. The liquid albumen is then allowed to ferment for two or three days, during which time the clear liquid settles to the barrels and is drawn off into pails by means of a stopcock. During the process of fermentation the acidity of the albumen becomes rather high, and in order to neutralize this an alkaline substance, usually ammonia, is added until litmus gives the alkaline test. The final stage in the conversion process is the drying of the albumen in shallow metal pans previously coated with vaseline, which takes place in steam-heated rooms ranging in temperature from 130° to 140° Fahrenheit. When completely dry the albumen is packed in wooden boxes lined with metal, zinc being used, as a rule. Shipments are generally made in 100 to 120 pound cases.

When egg yolk is to be shipped in liquid form the yolks are collected and run through sieves which grow finer and finer as the process continues. The product is then treated with either a 2 per cent solution of boracic acid or a 1 per cent boracic acid and 9 per cent salt solution, and after a 16-minute mixing process which takes place in wooden drums the yolks are ready for shipment in wooden metal-lined cases.

The only difference in the manufacture of liquid and dried egg yolk is that the latter contains no chemicals and is dried by means of large vacuum machines.

Prices of Dried Eggs and Albumen

Mixed dried eggs in 1,000-pound lots are purchasable on the local market for approximately 26 tael cents per pound (at the present rate of exchange 1 tael equals about $0.75 gold).

During June, 1915, the average price of hen-egg yolk as established by the leading exporters of the product was $21.18 gold per 133⅓ pound lot, locally known as a picul, or a trifle less than 16 cents per pound. During June of this year hen-egg yolk brought $22.24 gold per picul, or approximately 16¾ cents per pound.

Hen-egg albumen was selling at $48 gold per picul during June, 1915, or a little over 36 cents per pound, while the June prices of this year had jumped to $67.90 per picul, or a trifle over 51 cents gold per pound.

The rise in prices of egg products delivered in America is due only partially to the increased original cost. Since June, 1915, the exchange has decreased so as to give a 40 per cent increase in the laid down cost. Another important factor is the 300 per cent increase in freight rates. Higher insurance and rail rates also added to the above help to raise the price of egg products to unprecedented levels.

Nanking's Egg Trade

The only declared exports to the United States invoiced through the Nanking consulate during 1915 consisted of eggs valued at $87,118, of which 204,000 dozen were fresh eggs, valued at $14,099, and 2,337,096 pounds were frozen, in cans, valued at $73,019. Returned American goods were valued at $10,066. The returns show a decrease in direct exports, as compared with 1914, of more than $400,000, which is largely due to the war and the policy of the egg exporters in passing their output through the home market.

The eggs were obtained from Kiangsu, Anhwei, Honan, and Shantung Provinces via the water and railway routes leading to this port. It is said that the territory covered can easily supply an additional factory having a daily capacity of 25,000 dozen eggs.

Eggs frozen in cans comprised about 95 per cent of those exported. Of these cans, 50 per cent contained yolk, 30 per cent contained albumen, and the remainder contained mixed eggs. Over 2,194,000 pounds of these eggs went to New York City via Liverpool, and the remaining 140,000 pounds were shipped to Seattle. Eggs in the shell went to Seattle and Tacoma.

The returned American goods in 1915 consisted of empty ammonia cylinders which had been imported full from Seattle for the egg-export industry. The total exports of the British corporation engaged in this business amounted to over $1,000,000 during the year and comprised eggs (in the shell and frozen), feathers, poultry and game, sesame seed, beans, hides, frozen meat, and mules, as well as the numerous by-products of their large factory. Three years ago there was no direct foreign trade from this district along the lines established by this company, which has demonstrated what can be done and is extending its factory.

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*See also article on Egg Products plant at Shanghai in October, 1916, issue of *the Far Eastern Review.*

TIN AND TUNGSTEN IN MALAY PENINSULA

More than two-thirds of the world's supply of tin is mined in the Malay Peninsula, says an American consular report. Straits tin, as it is known in the trade, is of exceptionally good quality. Much of the tin is brought to the smelters of the Straits Trading Co., at Singapore, and after refinement is shipped direct to the United Kingdom or the United States in slabs approximately 99.9 per cent pure. The total exportation of tin from Malaya during 1913 was valued at $47,492,845, and $34,460,128 for 1914, with a total of direct shipments to the United States of $13,295,674 for 1913, $8,726,076 for 1914, and $17,991,042 for 1915. There is a tendency toward an increase in direct shipments to the United States. Some difficulty was experienced in direct exportation to America soon after the outbreak of war, as a prohibition was placed on the exportation of tin to any countries other than the United Kingdom or British possessions. This was later remedied, however, by granting permission to ship under export permits issued by the Export Committee of the London Board of Trade, which makes it possible to ship direct to United States ports. The price of tin, at the beginning of 1915 was $663 a ton, compared with $778 a ton at the close of the year, while $825 per ton was reached during the month of November.

The increase and later decline in the production of tin and tin ore in the Federated Malay States is shown by the following figures for the State of Selangor, the principal source of production: 1889, 10,700 tons; 1893, 16,100 tons; 1894, 20,200 tons; 1895, 22,000 tons; 1899, 14,900 tons; 1901, 18,400 tons; 1911, 13,700 tons; and 1914, 15,500 tons.

The tendency during the last 20 years has been generally downward. The whole question is affected by labor conditions and the price of the metal. With prices ranging between $700 and $750 a ton, there appears to be no reason why annual production should not remain steady for some years at approximately 15,000 tons. The decrease in output in the State of Selangor is due largely to the shrinkage in the Chinese labor force. The force of mining coolies in the Federated Malay States in recent years has been as follows: 225,405 in 1913, 171,689 in 1914, and 164,457 in 1915. The price for male labor was $6.80 per month throughout the year, exclusive of food, which is provided by the employers. Wages of female labor varied from 22 to 28 cents a day.

The British Government took over the whole output of tungsten ores, wolfram, and scheelite from British possessions and protectorates in 1915 and fixed the price for the ores at $13.37 per unit of tungstic acid.

The British Government is also doing what it can to stimulate the production of tungsten ores, and the Government of the Federated Malay States remitted local export duty of $1.14 per 133⅓ pounds on such minerals, and also issued notices offering State land free of premium to those who desired to work the same for wolfram, promising to give special facilities for the immediate commencement of work.

The following figures give the returns of wolfram exports for the last six years; these returns do not include any scheelite ore nor re-exports of wolfram produced elsewhere: 1910, 210,533 pounds; 1911, 375,333 pounds; 1912, 467,333 pounds: 1913, 462,066 pounds; 1914, 519,600 pounds; and 1915, 525,200 pounds.

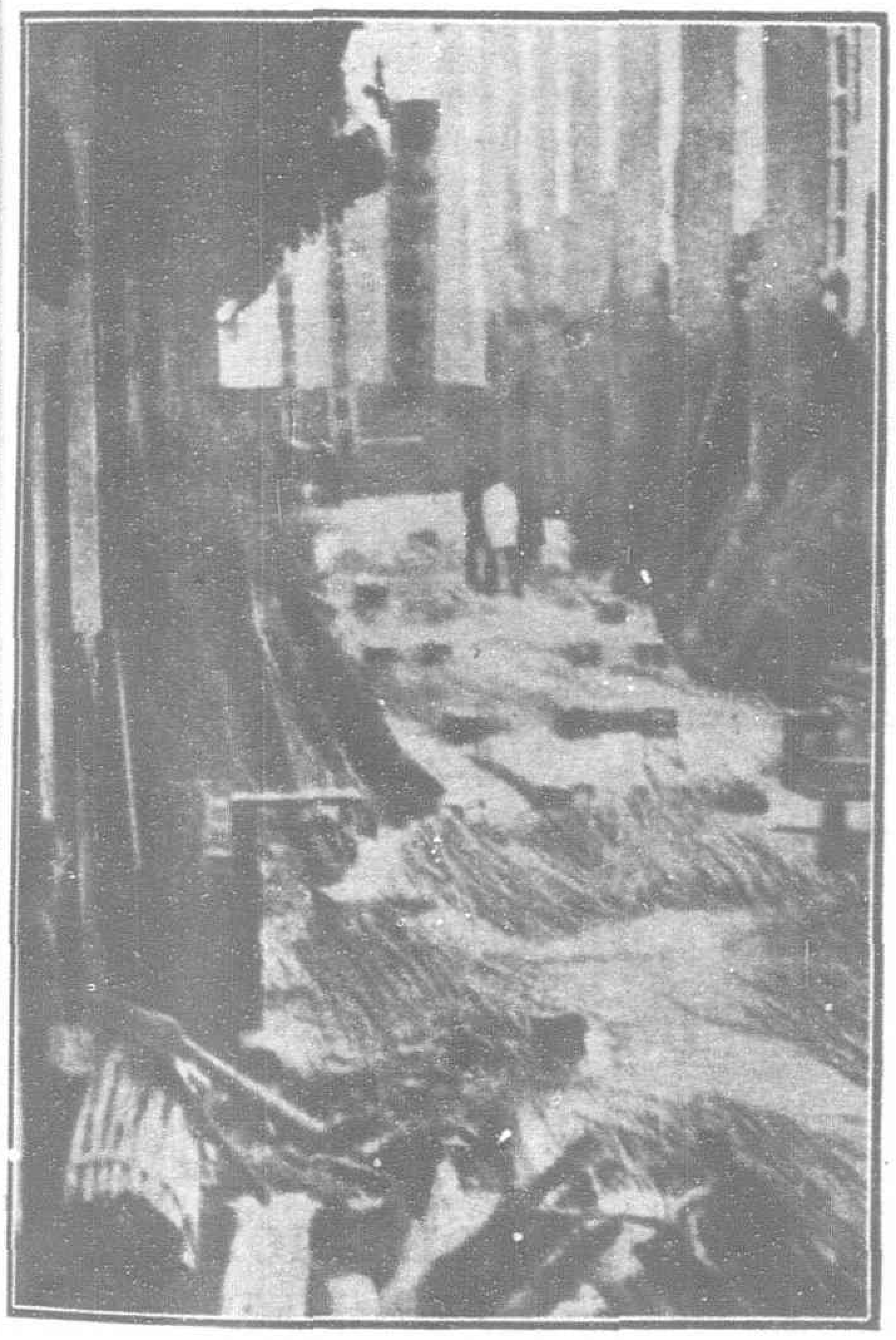
Imports of mixed ore from Burma have practically ceased, as the Indian Government prohibited the export of ore containing wolfram anywhere except to Great Britain. Permission has, however, lately been given to export ore from Burma to a few firms in the Federated Malay States. Imports from Siam have also fallen off, the high price of wolfram in America (i. e., $26.78 per unit) having deflected the trade to that country.

THE RATTAN INDUSTRY AT HONGKONG

[By LeRoy R. Sawyer, Division Superintendent of Schools, Tayabas, P. I.]

Numerous officials of the Philippine government, as well as private individuals resident in these Islands, have realized for some time that the amount of rattan taken from Philippine forests and the amount and value of both the raw and the prepared material exported are much lower than they should be. The construction of rattan furniture in this country is also comparatively restricted, for outside of Manila the types of rattan furniture which are made are such as will, in the main, satisfy local demands only. The San Miguel chair is an example of the type here alluded to.

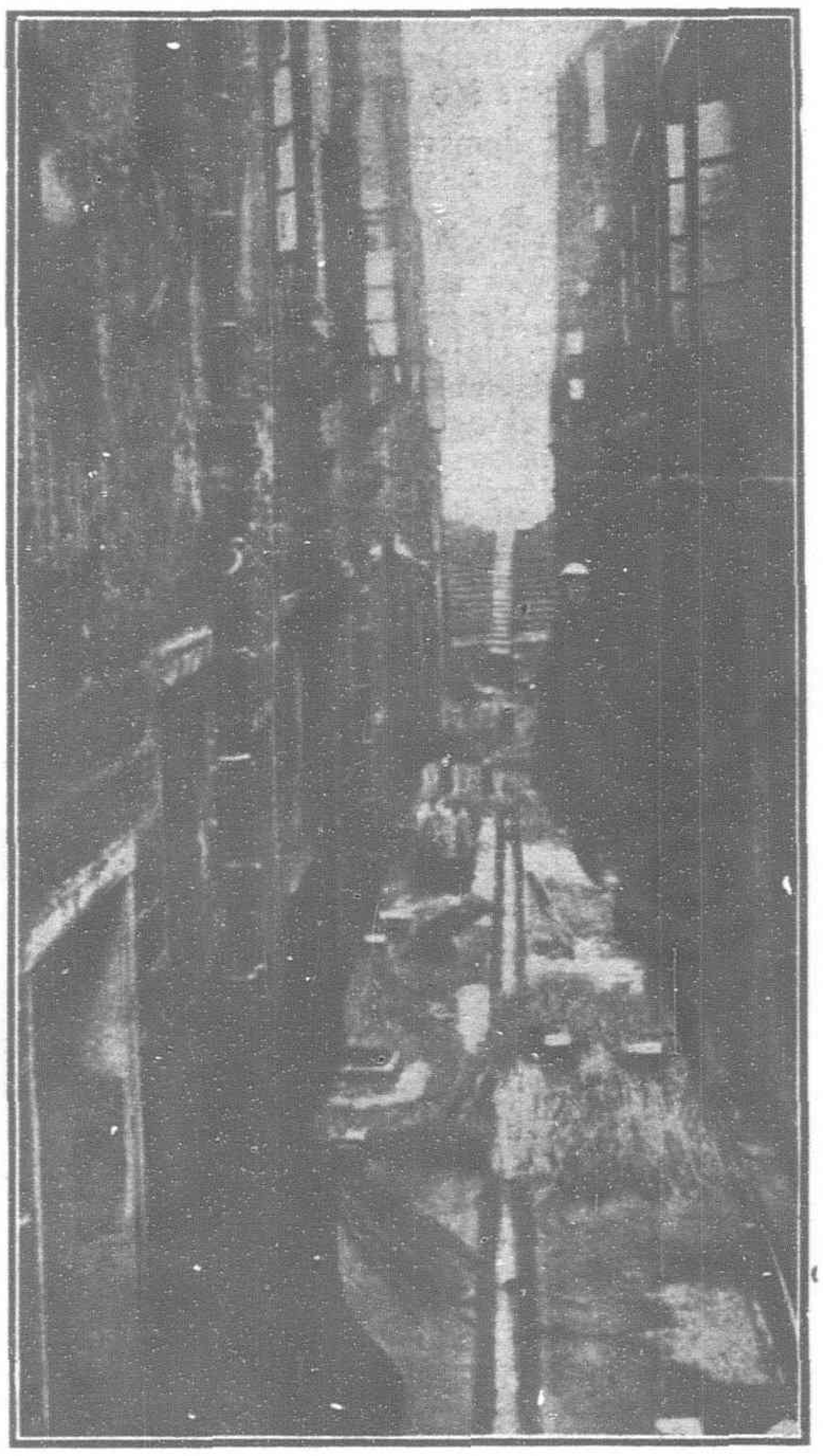
The Chinese residents in Manila who are familiar with this line of work form a small, closed corporation, as it were, and have made little or no effort to diffuse a widespread knowledge of the industry. The fact that the economic possibilities of this forest product are at present largely going to waste, led to the assignment of two employees of the Philippine government for the purpose of making a brief study of this industry as carried on at Hongkong, with a view to the gathering of facts and information which might be of value in their bearing on the situation here. The writer was one of those assigned. The actual time spent on the investigation amounted to less than 12 days.



Making Rattan Goods in Hongkong

It is generally admitted that a condition of apathy and indifference with respect to the economic advancement of their country often exists among tropical peoples; it is also true that in the past Filipinos have not been assured of the rewards of their labor, as they are now. If Philippine rattans are not of the very best, as is intimated later on in this article, there is, nevertheless, abundant evidence to show that there is a good and steady market outside of these Islands for the raw material provided it is properly prepared and classified, and to show that the making of rattan furniture for export can be profitably conducted on a larger scale when the matter of freight rates to the United States and other countries is satisfactorily arranged.

Styles and fashions are common to all articles intended for personal use and for use in the home; and from year to year, buyers who visited Hongkong have made new patterns in rattan furniture. A considerable number of samples of chairs and tables of very attractive design and workmanship, such as are not usually observed in the Philippines, was seen in shop and storehouse. The attempt to "snap" some of these pieces of furniture, as well as to take pictures of men, women and children preparing the material, met with fair success; and a few of the best photographs taken are reproduced in connection with this article.



An Alley in Hongkong Where Rattan Furniture is Made

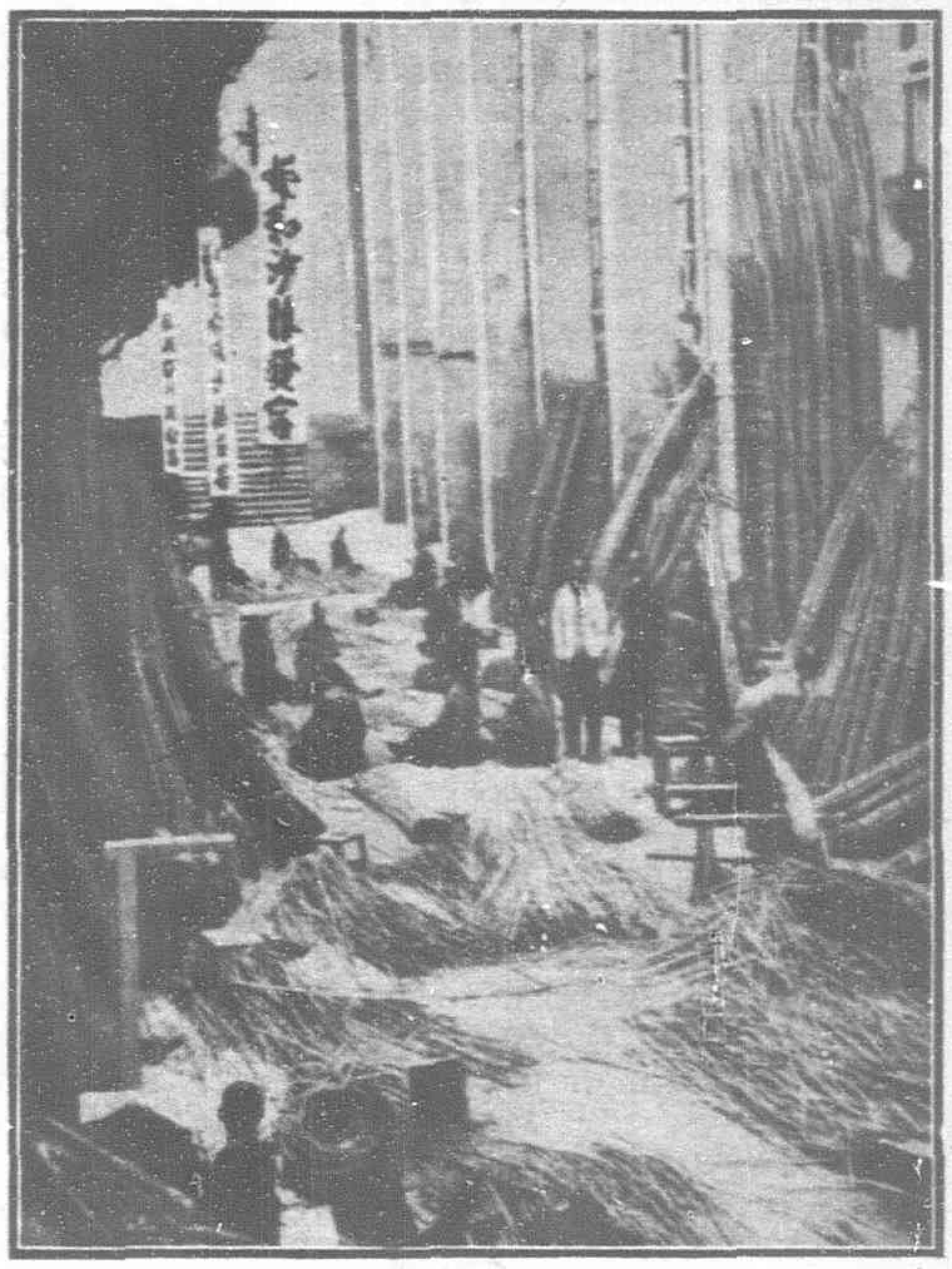
While much of the information here given is of general interest, two facts stand out very clearly in their relation to this industry as carried on in the public schools as well as outside: First, that proper methods of washing the stems and of classifying both stems and peel should replace the hit-and-miss practice of indiscriminate assorting in bundles now common in the Philippines; and secondly, the value of proper bleaching cannot be ignored. Teachers who really wish to make a success of this branch of industrial work will find the means to make effective the aids herein suggested, in order to secure the necessary improvement in these details.

Warehouses and furniture factories (shops) are to be found in various parts of the city, especially in the Wanchai district. The Chinese manager of the Oriental Rattan and Sea Grass Furniture Company was most accommodating, not only accompanying me on various occasions to different shops and warehouses, but showing himself very willing in the matter of furnishing data and other relevant information on the rattan industry. The warehouses of some large importers were visited, for the purpose of inspecting the manner of preparing and sorting the rattan for use. Also, the style and make-up of rattan furniture in many shops were carefully noted.

The following facts and conclusions may, it is thought, be accepted in consequence of the data and information obtained on this trip:

The rattan imported from British North Borneo (Sarawak and Kudat) brings the best prices on the Hongkong market. Java rattan and that from Penang and Annam (Saigon) are handled by importers. Practically all the raw material received at Hongkong comes direct from Singapore, the dealers there making consignments to their Hongkong agents. When shipments arrive at the latter port, the agent distributes samples of the raw rattan to prospective buyers, the supply being auctioned off to the highest bidders. A very small amount of Philippine rattan reaches the Hongkong market, though all the Chinese dealers and importers I met displayed a great deal of interest in the subject and were anxious to obtain samples.

Relatively, only a small amount of the raw rattan imported through Hongkong is actually sorted, cleaned, graded and prepared there, the greater part of this work being done at a village some miles beyond Canton, where this phase of the industry has become thoroughly established and where labor is cheaper than at Hongkong.



Alleyway Used as Factory

So far as is known, the two processes noted hereinafter are not practiced in the Philippine Islands; or, if so, to a very limited extent: The washing of the entire stems with sand and water and a piece of loose coir (sufficient to fill the hand), to remove the dirt and the many adhering particles of vegetable matter from the exterior of the stems, the bleaching of the stems, or of the peel, with sulphur fumes. Both of these processes are regarded by the Chinese as very important. After observing the effect consequent upon such treatment of the material, it is clear that no satisfactory classification based upon the color (and this is the most important) can be made except after the processes mentioned, or after some similar means, have been employed.

All rattan used must be thoroughly seasoned (dried) before any of the following operations are carried on: Paring off the nodules, or bases of leaf spathes. This work is done by girls and women with knives fashioned like old files sharpened on one long edge. With one hand the edge of the knife is placed longitudinally against the nodule, the knife is twisted in one direction and the piece of rattan in the opposite direction. Diameter and external color form the basis for sorting the rattan into grades. Stems 1.5 cm. or less in diameter are used for the making of "peel" and "core;" rattan suitable for framework and of a diameter of 1.5 cm. or more reaches Hongkong in long bundles, undoubled, for this specific purpose.

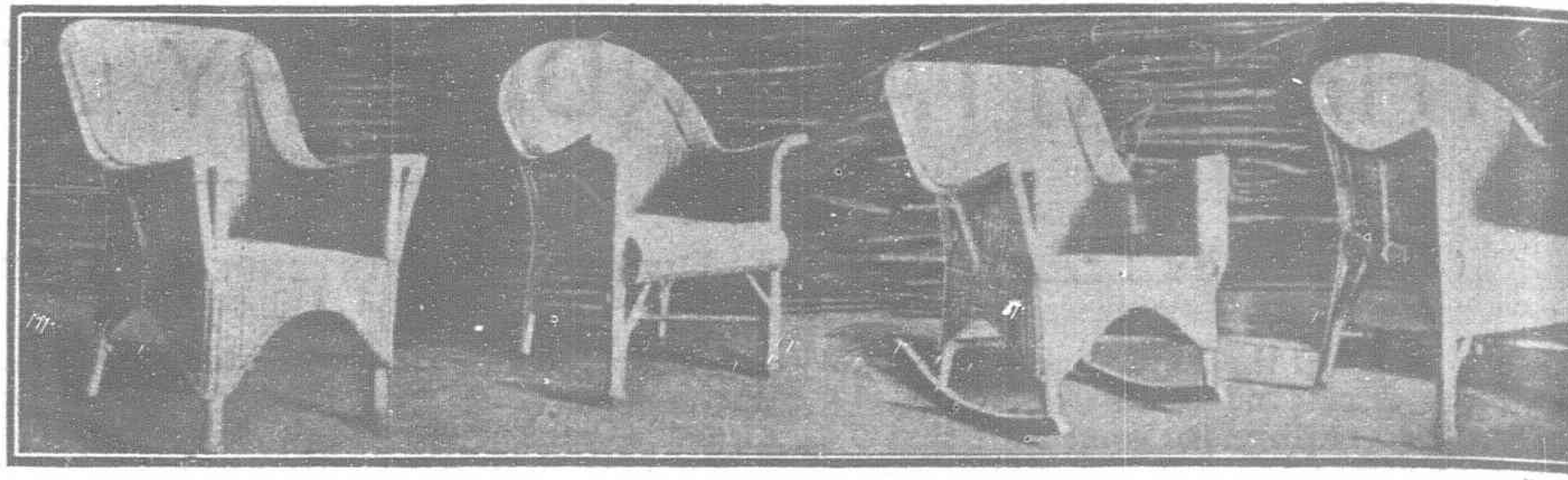
After the paring and sorting, the rattan is immersed in a vat containing water and sand; some of the latter is taken up in a handful of wet cocoanut husk, which, when rubbed vigorously lengthwise over the surface, removes all adhering dirt and foreign substances, bringing out the real color of the skin. After this process, the rattan which is found to be of sufficiently good quality is subjected directly to the bleaching process, if of the small diameter which is used exclusively for weavers in chair covering, or the peel is removed and bleached, the rest of the stem being used for core.

For bleaching, a wooden box of any given capacity is employed. Those seen at Hongkong are taller than a man and some ten feet in width. Two tiers of doors run across the front, to facilitate the inserting and the removing of bundles of whole rattan or peel. The bleaching agent is sulphur, a sufficient quantity of which is ignited in the bottom of the box. The rattan or peel is subjected to the action of the sulphur fumes for a period of some 24 hours.

For the preparation of peel and core the processes used are similar to those employed in the Philippines in the preparation of Calasiao and buntal hat material. The peel is first removed by hand, with a heavy clasp knife. A piece of rattan 0.75 cm. in diameter will give from three to four strips of peel, depending on the width desired. The peel is gauged as to thickness and width by drawing it between two knives placed close together in a vertical position. For the first process (thickness), the cutting knife is the one coming against the inside of the peel, which is drawn by hand between the knives. A uniform width is secured by drawing the peel in a flat position between another pair of knives, which trim off either edge. The core (or portion of the piece of rattan left after the peel has been removed) is again split by knife into as many strips as may be necessary, depending on the diameter of "core" desired. To "round" these pieces of core, they are drawn by hand through a sheet of tin or iron pierced with different sized holes, the same as is the Filipino "batacan."

So far as I could ascertain, no machinery whatsoever is employed in connection with any of the various phases of the preparation of the material, nor are any such devices known to the Chinese there. Interest was manifested in the German-make machine for preparing peel and core in use in Billibid prison.

A number of different grades, particularly of the peel, are recognized by the dealers. For practical purposes, these grades may be limited to five or six. Grade one (peel) is of an even straw color and thoroughly flexible; grades two and three are less perfect as to this standard color, and perhaps less flexible. The remaining grades lack an even color and are little used for furniture purposes, but serve for binding packages, bundles and bales. While the classification of the core, or heart, seems to be less general, the price depends upon its relative flexibility, the evenness of the color, and the extent to which it has been cleaned. A difference of as much as 20 pesos or 30 pesos Mexican per picul exists between peel of the best and that of inferior grade.

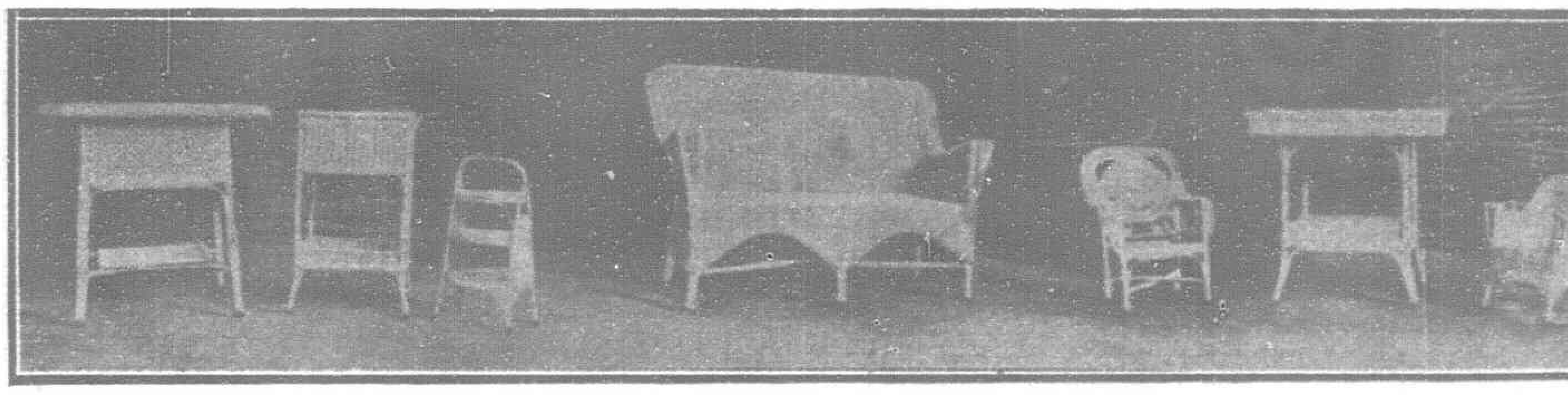


Typical Chairs Made in Hongkong

Some four species grow in Southern China, but not in sufficient abundance to be exploited commercially. Since the outbreak of the European war, the price of rattan, in both the raw and the prepared state, has increased from 50 to 75 per cent in Hongkong, so dealers and importers there informed me. This is due mainly, I understand, to reduced tonnage available and consequent increased transportation charges. The best grade of the peel now brings as high as $60 Mexican per picul.

The biggest demand seems to be for furniture wrapped or covered with rattan core; next, for the sea-grass, or linen-fiber, type; while no dealer advised me that over 5 per cent of his sales were in furniture wrapped with the peel. More rattan furniture is exported to the United States and to South Africa than elsewhere. Many sales are also made to cities along the China coast and to the English possessions in Asia.

On account of its interest and bearing on the rattan industry in the Philippines, I took occasion to extract certain material appearing in the Annals of the Royal Botanic Garden, Calcutta (1908), from the publication "Asiatic Palms," by Dr. Odoardo Beccari, which was placed at my disposal by the superintendent of the Botanical and Forestry Department, Hongkong. While mainly a scientific work, the introduction to this book contains a certain amount of practical information on the subject of rattans, which it seemed desirable to attach hereto:



A Few Examples of the Kind of Furniture Made in Hongkong for the American and European Markets

The stems of Calami are usually rather spongy in the center, and are always very hard externally, though they are at the same time flexible and elastic. The stems of Calami divested of their sheaths have almost always a polished surface, and look as if covered with a thin layer of vitreous varnish; sometimes, however, the surface is opaque, but almost always is of a straw-yellow color, especially when dry. This vitreous appearance of the naked canes of many Calami is due to the presence of a very thin layer of a silicious substance which entirely covers them.

The more polished and vitreous the surface of a stem is, the more it is impregnated with silica and the more it is valued for economic purposes. In the category of species whose stems are thus valuable are included C. coesius, C. optimus, C. tenuis, and C. rotang.

The process of cleaning and reducing the canes of Calami into fine strips is termed by the Malays "raut" and from this word is derived "rautang" whence "Rotang," that is to say, the object which it is possible to reduce to strips by the "raut."

The process of collecting and preparing rattans is very simple. When a Rotang plant has been found in the forest, the stem is cut near the ground and is detached from the trees, from which it is suspended by its hooked thongs, by taking a strong hold of its base and then pulling down the entire plant with its leaves. In order to clean the plant of its leaves and especially of the spurious sheaths that clothe the stem, the top of the plant is cut off and then, handling it from the upper end, the stem is forcibly drawn in the opposite direction between two pieces of wood. In this way the stem is easily stripped of its spiny coverings and is then cut into lengths of about 5 meters each. These pieces are bent into two equal parts and fastened into bundles; in this state the canes are brought to the market. The Rotang which are thus prepared, and are most valued by traders, are not thicker than a man's little finger and have a fine, polished, straw-yellow, glassy surface.

I have no reliable data as to quantity of rattan canes imported to Europe from Eastern ports. It is not even known what quantity is produced in each country. It is, however, certain that Borneo must supply a very large proportion of those that are put on the market.

With the exception of the Malaca cane it is not exactly known from what species the rattans of commerce are obtained.—*Furniture Manufacturer and Artisan.*

A REVOLUTION IN METAL BEDS

The tubing for the Simmons bed is drawn by specially designed machinery from shell-like sheet steel. The coam is electrically welded, after which the tubing is cut and formed into proper sizes and all joints electrically welded and frozen together by a special process in The Simmons Factory. When put to a test these joints show that it is impossible to break them, and the only means by which the connections can be separated is by cutting the metal itself.

There is also a decided advantage in this bed in the smoothness of the surface, which enables the application of a finish the equal of any highly polished piece of furniture. The cold rolled steel tubing gives a new blade surface, and has proven the most excellent foundation on which to flow the specially prepared Simmons enamels, which are baked coat after coat, and produce a finish previously unheard of.

CONDITIONS IN THE PHILIPPINES

By Harold M. Pitt, President Manila Merchants' Association

A survey of the local business situation prompts conclusions that are most assuring. Crop prospects, on the whole, were never better. Continued rains insure an exceptional rice yield, and tobacco planting in the Cagayan Valley is starting under highly favorable conditions. The next few months should see a large increase in hemp and copra receipts, and, while it is claimed that there may be a falling off in the Negros sugar production, the results may bring a surprise similar to that experienced with the 1915-16 crop.

The freight situation is causing some apprehension and a shortage of bottoms for transporting our export products is predicted. Hemp rates have already advanced from P1.20 to P2.00 a hundred and further advances are looked for. This is probably the most unfavorable feature of the situation.

The market continues strong for all of our export products and prices are very satisfactory.

The foreign trade of the Islands for October was more evenly divided between exports and imports than during any preceding month of the year. The balance in favor of exports was a little less than P525,000. This brings the total favorable balance for the 10 months of the current calendar year up to P45,035,817. If measured by quantities, the trade for the month would be much smaller than for the same month last year, but on account of the high prices, both for exports and imports, values are materially higher. This is most marked in the case of hemp. Shipments in October amounted to 6,379 tons as against 9,025 in October, 1915, yet the value for October this year exceeded that for the same month of last year by P146,607.

Copra and tobacco shipments in October both showed values substantially higher than those for last year, while the figure for sugar was also greater.

The two remaining months of the year will probably show a falling off in exports and an increase in imports, in comparison with the preceding months of the year. The reason for this is that facilities for importation will, if anything, be increased, while for exportation they will be reduced on account of the tying up of shipping in Vladivostock.

October showed a slight gain in imports, compared with October of a year ago, and this is the only gain recorded in any month of the year since May. The increased importations of rice, however, more than make up the gain. Rice imports for October were greater by P531,803 than for October last year.

Among other important increases are coffee, P138,306, chemicals, etc., P101,266, leather and manufactures of, P101,684, and dairy products P101,312. Iron and steel products showed a falling off of P434,037, wheat flour P248,550, illuminating oil P247,445, coal P178,037, and cattle, other than carabao, P119,717.

Exports for the month were about P1,700,000 greater than for the same month last year. The largest increase was made by sugar, amounting to P1,520,829, a gain of over 150%. The value of cocoanut oil exported was greater by P381,683 than for October last year, while embroideries jumped from P84,169 to P334,504, a gain of P250,335. Hemp, maguey, and cigars were other articles showing material increases, while copra fell off in value over one million pesos.

One of the most gratifying developments is the large business that is being worked up in the embroidery trade. The exports for the ten months of this year amount to P1,774,809 against P449,854 for the corresponding period of 1915.

The following table is of interest as showing the great advance made during the year in the export business of the Islands as compared with last year, and the products that are responsible for the increases:

Value of Principal Exports January 1st. to October 31st.

Articles.	*1916*	*1915*
Hemp	P46,764,437	P35,280,883
Copra	10,137,062	19,167,136
Coconut Oil ...	6,671,894	4,689,148
Embroideries ...	1,774 809	449,854
Sugar	34,148,373	21,823,620
Tobacco leaf ...	4,765,535	2,650,367
Cigars	4,540,626	3,366,245

As heretofore noted, the balance of trade in favor of the Islands was brought to over forty-five million pesos with the close of October. This record is remarkable and the fact suggests the presence in the Islands of a large amount of money that is not in active use. The banks report that deposits have not increased and the only inference possible is that producers are hoarding considerable sums of money.

Continued high prices for our export products and heavy crops that are confidently expected for the coming year should raise the purchasing power of the people of these Islands to a point unheard of in their history.

The reports of the Bureau of Customs of several exports do not include exports of the precious metals, but they are contained in a separate statement and it is a matter for congratulation that the production of gold bullion is increasing steadily and promises soon to assume important proportions.

In October, 1916, shipments of gold bullion amounted to 9,498 ounces valued at P282,403, as against 1,579 ounces valued at P52,108 for October, 1915. The Colorado Mining Company, whose properties are located in Masbate, and the Benguet Consolidated, which is operating in the Benguet region, are leading in gold production.

COTTON SPINNING IN JAPAN

One of the leading industrialists in Japan, Mr. Yamaji Muto, managing director of the Kanegafuchi Spinning Co., the largest concern of the kind in Japan, has an interesting article in the Koshi Keizai, the following being a translation:

The cotton spinning trade generally believe that the industry is now in a state of greater prosperity than any other industry in Japan. This might be so when we make comparison only among those that exist within the empire, but if we once compare it with the spinning industry throughout the world, we cannot but feel pessimistic.

In reviewing the cotton spinning industry, we find only 2,800,000 spindles, which consume 2,500,000 tons of raw cotton, the product amounting to Y220,000,000. Of this the quantity that is exported to China and India in finished and half-finished goods—thread and fabrics—is estimated at about Y100,000,000. Compared with other Japanese industries it might perhaps be the greatest and most profitable, but it cannot be compared with the scale abroad. As the total number of spindles in the world is now believed to be over 150,000,000, Japan's is only a little over one hundredth of this aggregate. Russia is regarded as the most rudimental country in this particular industry among the nations, yet she has 9,000,000 spindles which work day and night incessantly. In other words Russia is over three times greater in this respect than Japan, and even India has twice the number we possess. Thus making our position clear, we cannot help feeling somewhat ashamed of our dull growth in spite of the fact that our island country is matchlessly adapted for this industry.

The time when Japan can really compete with western countries in foreign trade is still remote. As to the present state of our trade, the raw cotton that we import costs one-third of all our imports, and the finished export goods from this raw material renders as much as one-sixth of the entire income from the export trade. Consequently, it cannot be denied that cotton is one of the most important elements in our foreign trade. The only market for our cotton goods, however, is limited to a narrow section of China. China imports annually Y250,000,000 worth of cotton thread and fabrics; Great Britain alone commands over Y100,000,000 of this huge trade and other western countries also share in the trade. Japan has wonderfully increased her export there in recent years, but it amounts to only about Y80,000,000.

India pays the surprising sum of Y400,000,000 per year for cotton thread and cotton goods, of which Japan's share is not more than three per cent and the remaining ninety-seven per cent is practically monopolised by Great Britain.

Cotton-mills in China

When China increases her import duty there is no other course for our industrialists than to move into China, build new cotton mills, and thus escape the heavy burden. In erecting such mills in China, however, is not only the difficulty of securing the skilled labour but innumerable inconveniencies will arise, and the situation must be studied very carefully. It is not yet settled among the Chinese authorities whether that nation adopt the protected or free trade policy, and of course, it might be a hard task for her at this moment to abandon her protection policy entirely. When one considers impartially and thoughtfully about the relations between these two nations—the benefit that this commodity offers to many million consumers—and understands the loss that will arise from excluding Japanese goods, he must shun the protection policy and adopt that of free trade. Then it is most important that our nation should also adopt the free trade policy and offer equal chances for China.

It is quite natural that the world powers should persistently endeavour to acquire rights in China, since the country is a sealed warehouse of immense potentiality. Here, it is grievous that the economic relations between Japan and China are not gratifying, in spite of the fact that the two nations have very intimate relations, historically and geographically. Whatever the past may have been, the two must cherish the closest co-operative relations in future, so as to ensure the safety of this giant republic and to ensure Japan's economic independence. The present war has taught us a valuable lesson: that no nation can make war without first of all ensuring her economic independence.

Japan alone can never make sure of her economic independence as she lacks the raw material. But, fortunately, China can supply what we need and thus create our independence. In this relation, Japan can develop her colonies as producers of raw material and at the same time open up the source of concealed wealth in China, thus securing the latter's advancement. For all these reasons, it is best that Japan and China should go hand in hand as free traders, and that is the foremost question awaiting decision between the two nations. This, therefore, is not only a question concerning cotton spinners but our nation at large.
—*The Far East.*

PHILIPPINE NATURAL DYESTUFF MATERIALS

The scarcity of the available synthetic and natural dyes and the less satisfactory results generally obtained by the use of the latter make the problem of obtaining coloring matters for use in the textile manufactures and other industries a serious one at the present time.

Germany has furnished most of the artificial dyes for the world. Since an embargo has been laid on the export of German goods and dyes can no longer be obtained from this source, concerns that use dyes in their processes are turning to all quarters in the hope of finding relief from this shortage. Much interest is being manifested in the use of naturally occurring dyes. Many inquiries have been made in regard to the plants used for dyeing purposes in the Philippine Islands.

In order that these inquiries may be answered the information that follows is offered by the Bureau of Science:

Natural dyestuff materials are found in the Philippine Islands, yet it is doubtful if they will attain much commercial prominence. Probably more than one hundred species of plants containing valuable color principles are found in the Philippines, and many more undoubtedly could be readily cultivated. In many cases the colors produced are inferior in quality, being either fugitive or not clear. As the plants yielding dyes grow wild and often are widely scattered, the supply of the material is unreliable and insufficient. Little has been done toward developing the extraction and manufacture of local coloring materials, and until the intense cultivation of the necessary plants and the capital necessary for the enterprise can be secured there is little prospect for commercial success. For example, commercially but two dye-plants at present found in the Philippines are of importance: namely, the well-known indigo, and *sappan* or *sibucao.* Others are used locally, but scarcely enter into the local commerce, much less into the external commerce of the Archipelago. The following paragraphs discuss the commoner locally used Philippine dye-plants:

Indigo (*Indigofera tinctoria* Linn. and *I. suffruticosa* Mill.), locally known as *tayum, tayom, tagum, pauay, tayum-tayum,* and *tagung-tagung,* was formerly extensively cultivated in some parts of the Philippines, and the prepared product entered extensively into the export trade. However, with the development of the coal-tar dye industry and the manufacture of artifical indigo, the cultivation of indigo as a commercial crop in the Philippines practically ceased. Indigo is still cultivated on a small scale in some parts of northern Luzon, but only to supply a limited local demand for blue coloring matter. It is possible that the extraction of natural indigo might be profitable at the present time, but the rehabilitation of the indigo industry would take time and a considerable investment of capital in extraction vats with the practical certainty that at the close of the present war, the industry would soon be replaced by the competition of the cheaper coal-tar product.

Sappan or *sibucao* (*Caesalpinia sappan* Linn.) is a shrub or small tree and is widely distributed in the Philippines in the settled areas at low and medium altitudes. It is not systematically cultivated, yet in a few districts it occurs in great abundance, such as Guimaras Island and parts of Panay, but in general it is found only as a widely scattered tree. It has valuable properties and yields a red dye. The wood is annually exported in considerable quantities to southern China.

This wood yields about 2 per cent of coloring matter by extraction with water. For export trade the color should be extracted from the wood and the water evaporated, thus saving the freight on the wood, which constitutes the major portion of the dyewood and is of no particular value to the buyer. Bacon, a former member of the Bureau of Science, has shown that this wood contains brazilin, the coloring matter found in Brazil wood. Brazilin, or brazilein, is not a fast dye and has the objection of being very sensitive to acids and alkalies.

Brown dyes are secured from numerous plants, chiefly from the shrub or small tree known as *bancudo*, or *nino* (*Morinda indica* Linn.), certain of the mangrove trees such as *Ceriops* and *Bruguiera*, the bark of *Xylocarpus* (*tabique* or *nigui*), and from numerous other less important species. Many of these barks are useful in tanning as well as in dyeing.

Bancudo is the well-known ál dye of India. It requires the use of a mordant since it does not dye cotton directly. Cotton mordanted with tannin is colored dark red by *bancudo.*

Black dyes are secured from *Heritiera litoralis* Dry. (*dungon late*), a common coastal tree; and from some species of *Hibiscus, Semecarpus, Terminalia,* and *Diospyros.* The determining character in most cases is the presence of tannin in large quantities.

Yellow dyes of minor importance are secured from the seeds of *Bixa orellana* Linn. (*achuete*); from the wood of *Nauclea* (*bancal*); from *Carthamus tinctorius* Linn., which is occasionally cultivated as a dye-plant; from the bark of the common mango; from some species of *Vitex* (*molave*); and from *Arcangelisia* (*ligtang*), a woody vine having yellow wood rich in berberine.

Berberine is found in several plants of the Philippine Islands: namely, *Archangelisia lemniscata* Becc. (*albutra* Tagalog), *Mahonia nepalensis* DC. (*conig*. Ilocano), *Toddalia asiatica* Kurz (*dauag*, Tagalog). Cloth dyed with berberine does not show as bright a yellow as that dyed with turmeric, but it has the virtue of being much faster to light than the latter.

Turmeric (*Curcuma longa* Lam.), Locally known as *dilao*, is an herbaceous plant of the ginger family. The yellow fleshy rootstocks are utilized for dyeing yellow, but the color is not fast, and soon fades. The plant does not occur in sufficient quantity anywhere in the Philippines to yield any large quantity of the rhizomes. However, its cultivation is a simple matter, and it can be propagated very readily. It is extensively cultivated in parts of India, but chiefly for its value as a constituent part of curry powder. In the Philippines it needs cultivation and exploitation to become of commercial importance.

Peristrophe tinctoria Nees, an herbaceous plant widely scattered in the settled areas in the Visayan Islands and sometimes cultivated on a small scale, yields a rather beautiful red dye, which is locally utilized in the Philippines. The parts used are the tender shoots and young leaves. This material can be crushed in a mortar, and the resulting pulp dried and preserved for future use. It is very doubtful if the plant can be secured in sufficient quantities, or that its commercial utilization is possible. It is known as *deora*, *taoda*, and *calaora* in Mindanao and Negros.

It seems evident that the known dye-plants of the Philippine Islands do not occur in sufficient quantity greatly to relieve the shortage in the dye supply. A study of the conditions in the United States under which the manufacture of synthetic dyestuff has been attempted, the lack of available raw materials, the large amount of capital necessary to start the industry, and the assured competition of European products after the close of the war are all unfavorable to the development of the natural dyestuff industry in the Philippine Islands.

MODEL SETTLEMENT AT KOWLOON

Arrangements have been concluded for the laying out of a model Chinese settlement at Kowloon (opposite Hongkong), says the Hongkong correspondent of the *North-China Daily News*, and in five years time the growing peninsula will be able to boast a large and commodious suburb which will be occupied by wealthy Chinese who, it is hoped, will take advantage of the opportunities offered in Hongkong and Kowloon of spending and investing their money. The idea of such a settlement was conceived by a body of influential Chinese who have formed themselves into a company, called the Kai Tack Land Investment Company, and their scheme is yet another instance of the remarkable manner in which land is reclaimed from the sea; that which is now a portion of the sea bed is about to be transformed into a small township.

The Kowloon suburb will not be a mean Chinese affair. The promoters of the scheme are quite ambitious and the fact that the necessary capital has been subscribed shows that the Chinese have great faith in the possibilities of the idea.

Where the sea now is, in Kowloon Bay, there will, in five years time, be a suburb containing no less than 42 blocks of substantial buildings, houses and business premises, there will be wide streets, ranging from 50 to 100 ft. in width, and the bund will be a spacious promenade .175 ft. in width and extending along the water-front for a length of nearly one mile. The blocks of 42 buildings will each occupy areas ranging from 150,000 to 200.000 sq. ft. and this will give some indication of the size of the model town. The streets and bund will also be lined with trees, in typical western style, and the sanitary and lighting arrangements will also be of the most up-to-date description.

The work has been commenced and a sum totalling close upon $2.000,000 will be spent on reclamation alone. The promoters of the scheme are confident of success. They say that there is great need for such a settlement and that many wealthy Chinese who wish to retire have refrained from doing so in their own country, with its possibilities of chaos, and have longed for some such settlement in a country which could promise security in their affluent days.

SHANTUNG IRON MINES

It has been decided, after all the attempts made by some enterprising private capitalists of Japan, that the experimental borings of the Chinlingchen Iron Mine should be made by the Shantung Railway Administration. There is a wide divergency between the German estimate and an estimate formed on a geological deduction as regards the wealth of the mine, says the "Manchuria Daily News," adding that an approximately accurate estimate as to the extent of the vein and also the quality of the ore is expected to be prepared upon the results of these borings. From Y. 20,000 to Y. 30,000, they say, is thought to be enough for the boring process.

PHILIPPINE BAMBOO, FIBERS, AND GRASSES AS MATERIALS FOR PAPER AND PAPER PULP

[Bureau of Science Bulletin]

For months past the newspapers of the world have been publishing articles on the advancing cost of raw materials and on the effect of this advance on various industries. They have pointed out in detail how the dearth of supplies from Europe has been the cause of this condition.

In the paper-pulp industry there has been an advance in the cost of all raw materials, and there seems to be no prospect of a change in the situation, possibly for a long time to come. There can be no change until the end of the war and perhaps for a considerable time thereafter. The great industries of the United States alone are demanding, and will continue to demand, a supply of paper pulp much in excess of the consumption previous to 1916. This demand will tax the capacity of the mills there to the utmost. A large portion of the writing-paper manufacturers of the United States are now wholly dependent upon the American manufacturing concern for their supply of bleached sulphite pulp. Any accident to the works of this one company, that should result in a shutdown or a curtailment of its output, would be reflected immediately in the shutting-down or curtailing of the product of a large number of writing-paper mills. There is a scarcity of all materials used by paper manufacturers; whereas, in order to maintain a stationary price of paper, the output of these products would have to be increased from 33⅓ to 50 per cent. In all the mills throughout the United States and Scandinavian countries unrest and strike conditions exist, and relief from Government contracts is being solicited.

A recent cable dispatch, received by L. D. Post, publisher and proprietor of The Paper Mill and Pulp Wood News, states that according, to reports from Christiania the Norwegian Employers' Union had declared a general lockout, affecting approximately 77,000 workmen. If the lockout is made permanent, there is every likelihood that the trouble will spread to all classes of workmen, including those engaged in the paper industry. In this event it is possible that America's chief source of imported chemical pulp may be eliminated. During February of last year, according to the most recent official statistics available, 8,371 tons of sulphite pulp, approximately one third of the total amount imported during that month, came into United States from Norway.

At the present time occasional offerings of chemical pulp are accepted at prices quoted 200 per cent higher than the market price prior to the war. In the last few months the importation of pulp to the United States has decreased enormously, the plants are rushed to their limits, and the prices demanded for various classes of pulp have soared high and remain firm.

As an indication of prevalent conditions, British reports from London state that the receipts for April, 1916, as compared with the figures for April, 1914, show a reduction in the importation of paper pulp of 22.5 per cent with an increase in value of 28.7 per cent. England has placed an embargo on the exportation of waste bagging and old rope. The effect of this act was immediately felt in the rise in prices of pulp.

In the stock market unusual firmness exists regarding the pulp market. The foreign situation is causing manufacturers and dealers in the United States to hold firm for independent prices for whatever stock they have for disposal. American importers and manufacturers are quoting the following scale of prices (May 20, 1916):

	Per cwt.
Domestic bleached sulphite, delivered	$5.75 to $6.50
Foreign bleached sulphite, on dock	6.50 to 7.50
Domestic unbleached sulphite delivered	3.50 to 4.00
Foreign unbleached sulphite, on dock N. Y.	3.70 to 4.00
Foreign easy bleaching	4.25 to 4.50
Mitscherlich unbleached sulphite	4.00 to 4.25
Domestic soda fiber bleached, delivered	4.25 to 4.75
Scandinavian kraft pulp	4.50 to 5.00

During the two years previous to 1916 the price for the bleached pulps ranged from $2.10 to $3.05 in January, 1914; to $2.25 to $4.10 in December, 1915. In view of what has been said relative to price and shortage of raw material, strike conditions at the mills, and advancing prices and wages, it seems to the Bureau of Science that the time is at hand to emphasize the fact that we have in the Philippine Islands an unlimited supply of material fit for the manufacture of strong white paper pulp. Such materials are caña bojo, abaca or Manila hemp, cogon grass, and rice straw.

For several years the Bureau of Science has been investigating the suitability of bamboo, cogon grass, abacá, and various palm fibers for paper pulp. The data collected show that with due regard to local conditions an industry of great economic value can be developed. Careful surveys of some of the available bamboo fields have been made. Sufficient data with regard to the raw material, the quantity of bamboo available, and the cost of manufacture of the pulp are at hand, showing that the bamboo sodapulp industry can be developed for a possible export trade in direct competition with chemical wood pulp at present quotations. Other countries have already utilized the information obtained from this work, which ultimately should be the means of starting the paper industry in the Philippines. Samples of pulp manufactured from different Philippine materials can be obtained from the Bureau of Science.

Caña bojo is a bamboo of the genus *Schizostachyum*. In Bataan Province there are two contiguous areas of caña bojo: the one (block A) containing 1,200 hectares, of which it can be said with certainty that 800 hectares contain dense bojo; the other (block B) taking in an area of approximately 650 hectares, of which more than 40 per cent is covered with bojo.

In addition, smaller areas of caña bojo are found along Bamban, Buasao, Pinulot, and Bacon Rivers which form the basin of Colo River and also in the basin of Mababo or Balsic River. This area contains a greater portion of timber trees and is less heavily covered with bojo. Caña bojo is easily propagated. One person can plant daily about 400 prepared tubes, or he can prepare from 1,000 to 1,200, if the growing areas are not very far apart.

Richmond's work at the Bureau of Science on the making of paper pulp from caña bojo shows that both the sulphite and soda processes are applicable in its manufacture. The sulphite process yields fully 50 per cent of unbleached pulp, and with a much lower sulphur consumption than is required in commercial practice for wood. He shows that if bamboo pulp is most suited for use in an unbleached state then the sulphite process should be adopted by all means but that the material is not sufficiently light in color to be mixed with mechanical wood pulp in preparing news-print paper. It is entirely suited, so far as color is concerned, for use as wrapping paper, but it is too good a fiber to be used for this purpose or for newspaper work. Bamboo fiber is eminently fitted for paper for books and for certain grades of writing and lithographic papers, either alone or when blended with rag or sulphite wood pulp. If bamboo fiber appears better suited for book-printing and lithographic paper than for wrapping or news-printing papers, the soda process is more fitted for the treatment since bulk, softness, and opacity are the chief features of soda pulp.

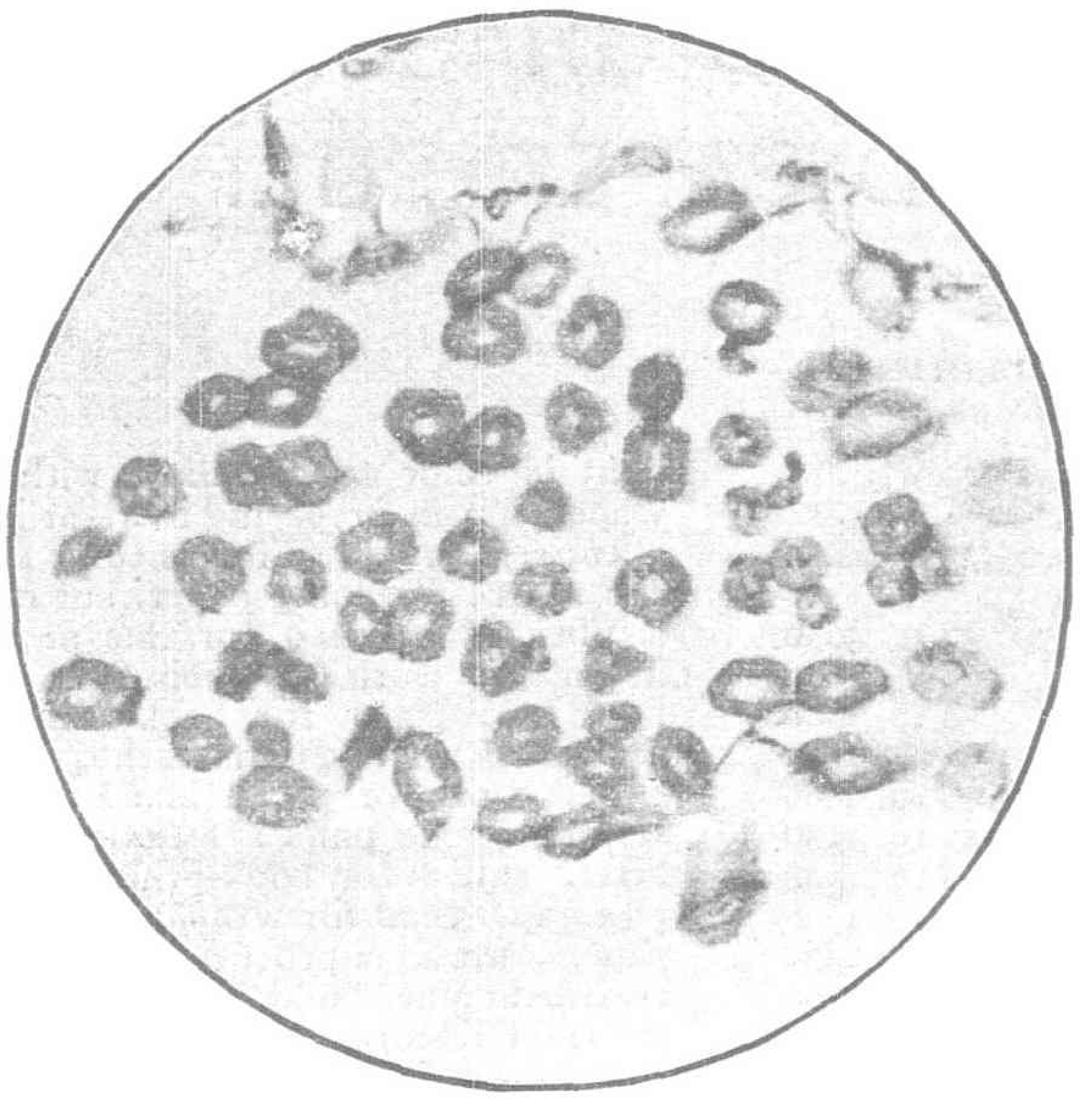
With caña bojo the soda process invariably yields from 43 to 45 per cent of air-dry, unbleached soda pulp. Such pulp bleaches to a splendid white with from 12 to 15 per cent of bleaching power. The fiber is strong, of good felting capacity, and makes a more bulky sheet than wood pulp. The fiber possesses the requisite length, strength, and felting capacity to meet the paper-makers' demands, and the quantity of resistant cellulose per unit weight of raw material is sufficient to warrant its extraction.

An area of 1,000 hectares of bamboo would supply a pulp mill of 20 tons' daily capacity for three years of 300 working days each without taking into account the growth of the bamboo during this period Working on a three-year rotation basis, which is entirely feasible, such an area would supply a mill of this capacity indefinitely. Since an area of 2 kilometers' radius contains over 1,200 hectares, it is seen that the question of transportation of the material to a given point, so far as the distance of the hauling is concerned, is not a serious one.

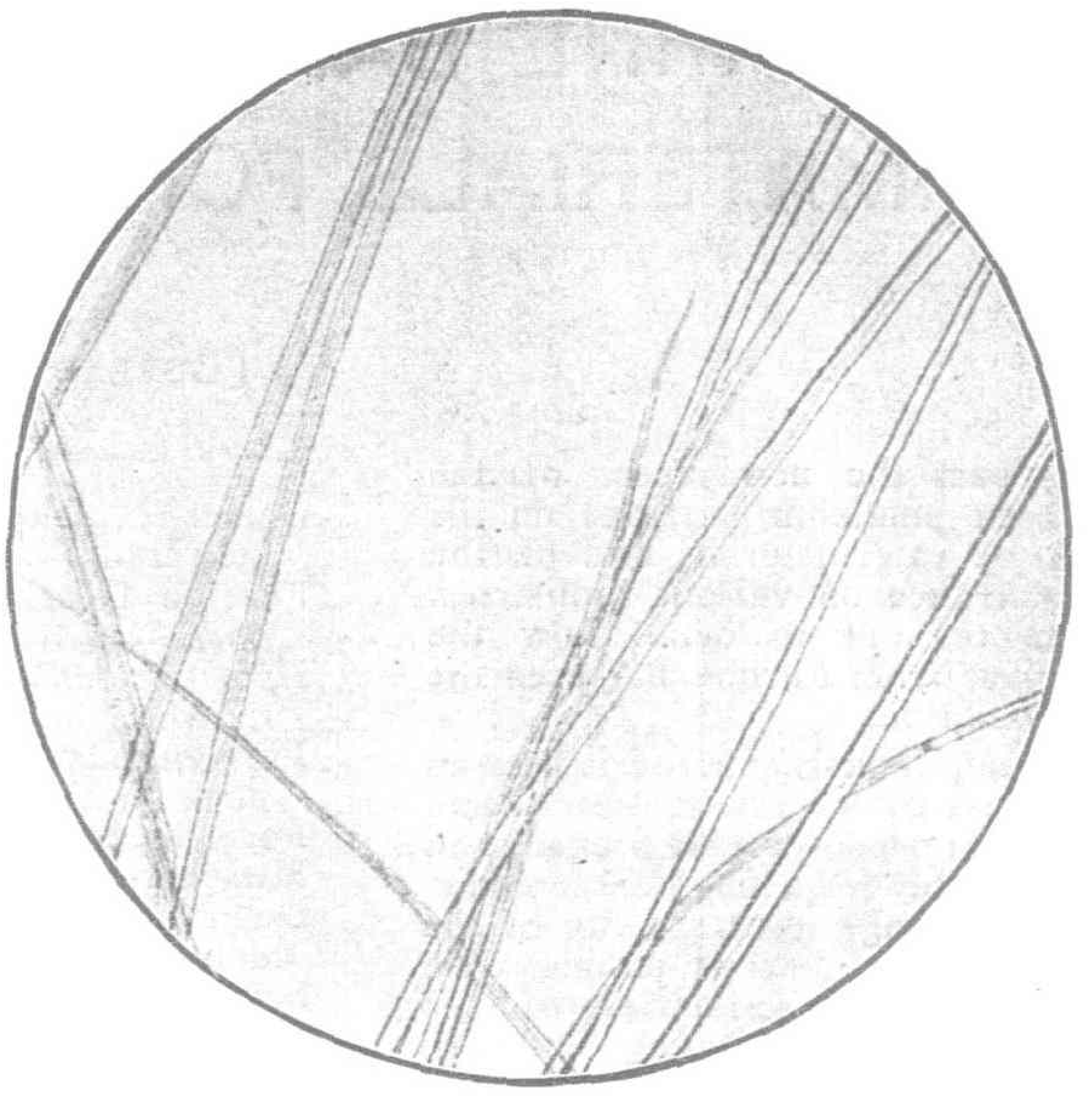
The Bureau of Science has estimated the cost of manufacture of pulp from caña bojo, dividing such cost into the following items: (1) labor; (2) fuel, power, etc.; (3) chemicals and supplies; (4) repairs, renewals, depreciation; (5) taxes, insurance, interest. All of these items have been discussed in detail in the Philippine Journal of Science. The article quoted shows that 200,000 dollars United States currency should be sufficient to build, equip, and operate a soda-pulp mill of 20 tons' daily capacity. Such a plant built in a modern manner and efficiently operated will produce unbleached, air-dried bamboo fiber at a maximum cost of 21 dollars per short ton f.o.b. Manila. If the excellent quality of caña bojo soda pulp prepared under favorable conditions is considered, a profitable export trade with Japan, Australia, and the Pacific coast of North America in direct competition with chemical wood pulp at ordinary quotations appears a not unreasonable expectation. One consideration of special importance is the reasonable possibility of obtaining the raw material in such quantity and at such a figure as to allow a manufacture at a profit even under conditions of maximum cost.

The best source of abacá for paper stock is in the Philippine Islands. Here is the home of real Manila paper stock.

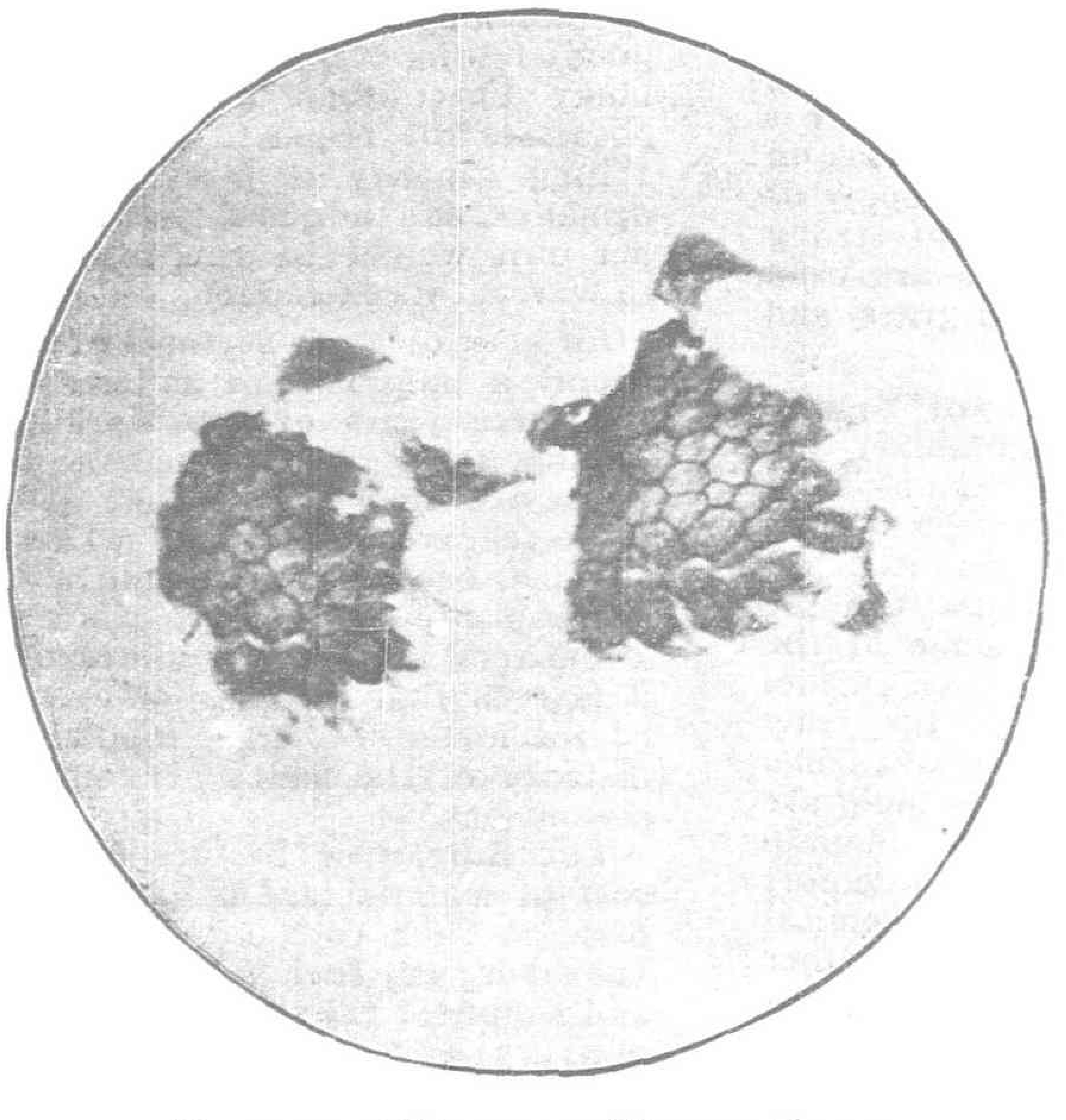
An average yield of approximately 50 per cent of strong-fibered stock can be obtained in sulphite digestions of abacá waste. This is about what may be expected from the best grades of waste it is possible to obtain, if the baled stuff is thoroughly deviled before it is subjected to any kind of chemical treatment. The soda process yields about 41 per cent dry pulp. Maguey waste gives results comparable with those of abacá. In the opinion of the Director of the Bureau of Science the reduction in cost of freight and handling incident



TRANSVERSE SECTION OF ABACA FIBERS



ABACA FIBERS SEEN LONGITUDINALLY



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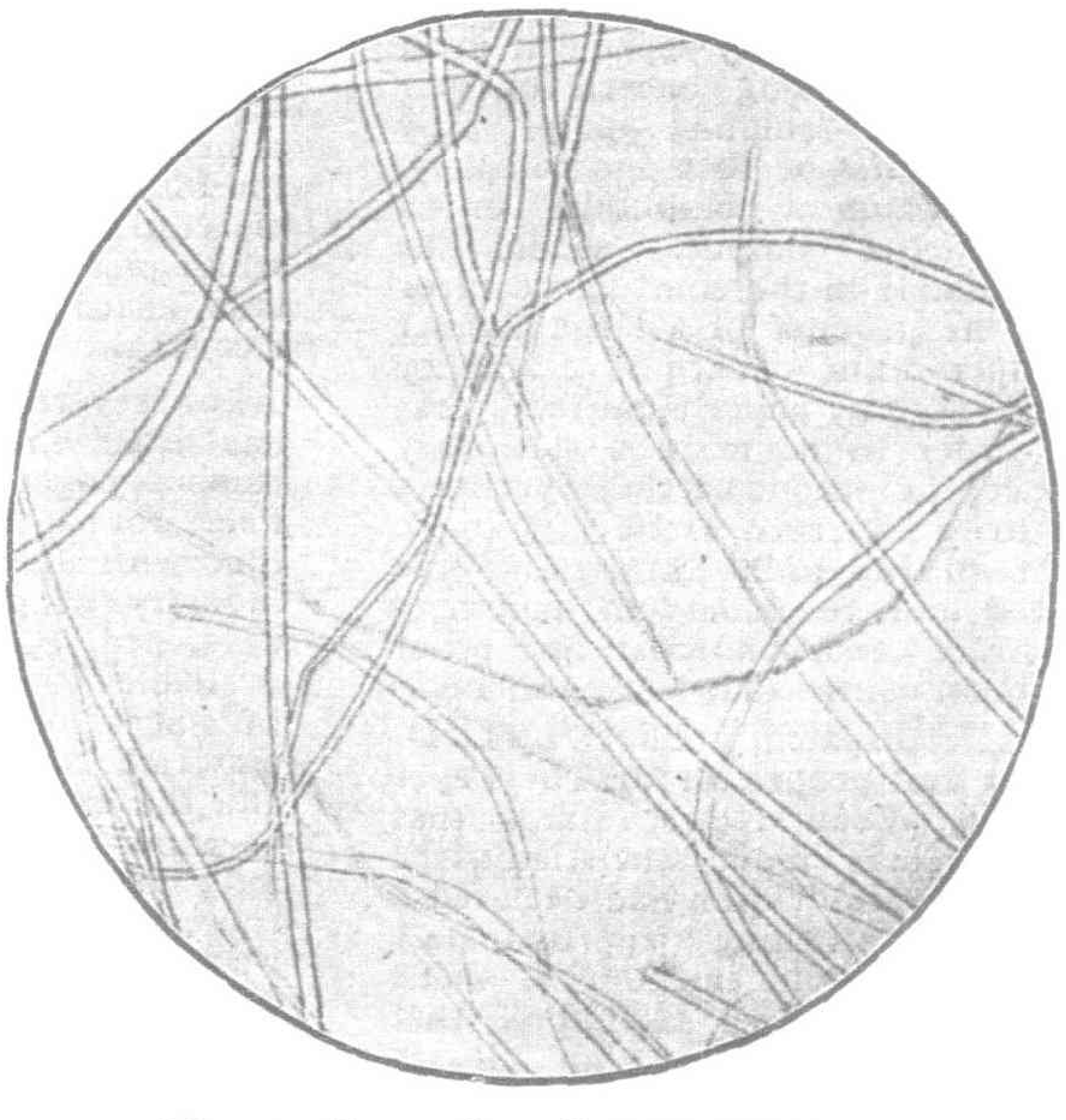

MAGUEY FIBERS SEEN LONGITUDINALLY

to placing abacá waste half-stuff on a foreign market, thus allowing a greater outlay in properly preparing the waste for the digestion process, is certain to bring better results if the quality of the resulting product alone is considered, than would the exportation of the raw product. To pulp the waste here for subsequent exportation would effect a reduction of 50 per cent in freights alone. The initial cost and daily running expenses of a hydraulic baling press would nearly offset the cost of equipment for a pulp mill of 10 tons' daily capacity.

Other sources of paper fiber are abundant in the Philippines. The Bureau of Science has investigated the value of many classes of palms and grasses relative to their pulp-producing qualities. It has been found that such grasses as cogon and talahib produce a soda pulp of excellent fiber. These grasses are abundant and of good quality in the Visayan Islands. Thousands of acres of rolling lands in Masbate and Burias Islands are covered with even stands of tall, thrifty cogon grass. Here the lay of the land is such that heavy-draft mowing machinery could be used to advantage.

A practical phase of the utilization of Philippine perennial grasses would be the material benefit to the forests, as the protection and cutting of the grass areas would greatly decrease the annual loss by forest fires, and any decrease in the cogon area is of great assistance in eliminating the locust pest.

Under factory conditions cogon and talahib give an approximate yield of 45 per cent dry, unbleached soda pulp. The loss in bleaching is approximately 3.2 per cent. The pulps made from cogon and talahib are comparable in their use to that of esparto.

Other minor sources of pulp from Philippine plants are bowstring hemp, coconut coir, the leaf stalks of the nipa palm, parts of the betelnut palm, the buri palm, and waste bejuco. Obviously mill waste could be worked up as paper pulp, particularly such waste wood as that left from the milling of lauan, cupang, and other Philippine soft woods.

In view of the above facts it is quite apparent that stimulus and opportunity are now offered the Philippine Islands to contribute their share to the pulp industry by the development of the natural resources which are at hand and await only the installation of modern pulping plants to form the basis of a growing and highly successful commercial enterprise.

SIAMESE TIN SYNDICATE

The ninth ordinary general meeting of the Siamese Tin Syndicate, Limited, was held on July 17, at Winchester House, Old Broad Street, E.C. Mr. Wm. H. P. Stevens presiding, the adoption of the report and accounts, saying that the whole of the formation expenses and the registration expenses in connection with the increase of capital, £26,214 19s. 4d., have been written off. This side of the balance sheet is all the more satisfactory from the fact that the loans, which in the last accounts figured at £8,000, have been paid off and the loans account has disappeared. Tin ore won in the nine months realised the large sum of £78,136 18s., and after charging all working expenses and the upkeep of the coconut plantations, we were able to carry to the profit and loss account the substantial sum of £32,070 6s. 3d. The profit and loss account for the nine months shows a net profit, subject only to excess-profits duty (if any) of $20,633 17s. 8d., being equivalent to a profit at the rate of only just under 23 per cent, per annum, which, having regard to the abnormally high cost of all stores, materials, repairs, renewals, freights and insurance during the period under review, must be regarded as highly satisfactory. Interim dividends of 10 per cent. each were paid out in October and March, absorbing £24,000, and there remains undivided the sum of £4,207 17s. 8d., which the directors propose to carry forward.

ENGINEERING, FINANCIAL AND INDUSTRIAL NEWS

RAILWAYS

Proposed Railways in Manchuria.—With the assistance of foreign engineers, the Chinese have surveyed several projected railways in northern Manchuria, including the Tsitsihar-Mergen-Sakhalin and the Harbin-Hailusien-Mergen-Sakhalin railroads. The first section, the branch line from Tsitsihar to Mergen, covers 240 versts (159 miles). The second section, or main line, from Harbin to Sakhalin, covers 700 versts (464 miles), as follows: From the shipyards opposite Harbin to Hulanchen, 20 versts; Hulanchen to Suihaisien, 80 versts; Suihaisien to Hailusien, 105 versts; Hailusien to Erkeshan, 90 versts; Erkeshan to Dedur, 50 versts; Dedur to Mergen, 125 versts; Mergen to Sakhalin, 230 versts. The second section has two branches: The first direct from Harbin, and the second from Harbin through Lansiensien-Tsingansien-Baitsuansien, district Manai-gun-Mergen to Sahaliang, which is shorter by 70 versts (46 miles) than the line through Suihaisien, Hailusien, Erkeshan, Dedur, and Mergen to Sakhalin. The line through Lansiensien and farther does not coincide with the interests of the Chinese Eastern Railway, because from Bai-tsuiansien a large part will be parallel to the Chinese Eastern Railway at stations Duichinshan, Mangou Sun, and Anda, and will at the same time go around the rich Tunken region (Hailusien), and especially the newly settled districts of Tunbeisien, Uyounichien, and Luimingsien. The country through which the projected Tsitsihar-Mergen-Sakhalin line will run is a plain from Tsitsihar to the village of Sinanlin, at the foot of the Little Hingan range, and is mountainous from Sinanlin to Sakhalin (80 miles). In the level section the line follows the present Tsitsihar-Aigun road. On this division it will be necessary to build three large bridges: One over the Uirgol (Huyouerhe) River, spanning 140 feet, and two over the Huelerhe River, spanning 350 feet and 140 feet, respectively. The soil is generally clay, but stony toward the end of the division. The excavation work, it is calculated, will amount to not more than 21,000 cubic feet per verst (31,700 cubic feet per mile).

On the second division from the village of Sinanlin the rise is 980 feet in 20 versts (about 74 feet per mile). Afterwards there is a drop of almost the same distance to the village of Erkzan. On this division four bridges must be built spanning from 140 to 210 feet over the Lanchanke, Kumurhe, Shenke, and Ehe Rivers. In this division are found rubble, common soil, and cliffs. The average excavation is calculated to be up to 3,500 cubic feet per verst (about 5,300 cubic feet per mile). For the drainage of rain water it will be necessary to build small bridges and culverts spanning in all 350 feet, and to protect the embankments from washouts it will be necessary to dig about 100 versts (66 miles) of hill canals (excavation 3,500 cubic feet per verst). Under such conditions, according to the preliminary calculations, the cost of building the new railway will be 30,000 to 40,000 rubles per verst ($23,300 to $31,100 per mile at the normal exchange rate of $0.515 to the ruble). The Chinese Government has decided to arrange so that the right of way be obtained free, by allowing the owners of land along the proposed railway to receive in another place twice the area taken for the railway. This will be a great saving because along the line for a distance of 200 to 230 miles in the direction of Hailusien the country is densely settled.

Chinese Eastern Line Lacks Cars.—Several thousands of cars of the Chinese Eastern Railway have gone into Russia and failed to return, say Japanese press reports, and the through goods for import to North Manchuria lying along the railway now exceed 3-400 carloads or 10,200 tons. Owing to the Chinese Eastern Railway shortage of goods cars the Japanese in North Manchuria and Siberia are said to be experiencing scarcity even in such bare necessaries as rice.

At present the import trade at Vladivostok stands virtually stockstill, and every bit of the railway carrying capacity is being taken up by goods for war purposes. Once goods cars reach European Russia they are detained and the Railway authorities find it extremely difficult to increase the number of goods cars for service on the Harbin-Kwanchengtze section. Even if through goods were to be carted all the way from Changchun to Harbin, as some such scheme is underway, the goods brought by that means would have to lie at Harbin because of the lack of cars obtainable on the railway beyond Harbin. The South Manchuria Railway is said to have requested an immediate increase of goods cars up to 125, the number previously agreed upon. The S. M. R. people, for their part, will re-enforce the working gangs at Changchun junction station and will even raise the wages of the coolies to the end of facilitating loading and unloading of cars.

Nicholaievsk's Port Facilities.—Upwards of 30,000 tons per annum is the estimated capacity of Nicholaievsk which the Russian Government has opened as a new Pacific terminus for the Trans-Siberian Railway. This port is at the mouth of the Amur River, near the head of the Gulf of Tartary, about 850 miles north of Vladivostock. Goods received here will be transported inland up the Amur River to Stretyinsk, which is reached by a rail-road that connects with the Trans-Siberian line. It will thus help considerably to relieve the pressure on Vladivostock which has been the only gateway to Russia unmenaced by hostile warships, aside from the route through Manchuria to Harbin which is of very limited assistance.

The Trans-Siberian Railway is one of the great engineering achievements of the world, says Paul P. Foster in an article in the Review of Reviews. He calls it a monument to the vision, perseverance, and skill of the Russian engineer. The double tracking of this 6,677 mile-long railway was begun some years ago. When the war started thousands of additional men were set to work to hasten this vast undertaking, and the second track has recently been finished, in time to facilitate the shipments of the enormous stores of artillery, projectiles, explosives, machinery, and goods of all kinds from the United States, Japan and England. Thirty-one million tons of freight arrived at Vladivostock in the first four months of 1915, compared with 2,195,000 tons in the corresponding period of 1914. Thousands of workmen have been struggling night and day to enlarge the docks and port facilities, and the wharves are being trebled in length to accommodate at least forty great freighters at one time. Some of this congestion will be relieved by the routing of shipments to Nikolaievsk which has become chief port of supply for the mining district of Chita and other prosperous Siberian communities previously served *via* Vladivostock.

Shantung and Tientsin-Pukow Traffic.—The question *re* the resumption of through traffic between the Shantung and Tientsin-Pukow Railways has been pending since the occupation of the former Railway by Japan in 1915. The first official meeting was held on Nov. 15th, 1916, between Mr. Kitada, of the Shantung Railway, Mr. Huang, of the Communications Office, Peking, and Mr. Chou, of the Tientsin-Pukow Railway. Nine meetings have been held since and an agreement had been nearly reached (on January 20) to restore the connecting arrangements to what used to obtain under the German regime. According to the agreement, all cars of one line fully loaded with through goods are to be admitted to the other line, whilst those only partially loaded shall have their contents transferred to the other line at the junction station. As regards the through passenger traffic, the Tientsin-Pukow Railway people thought it unnecessary and the matter has been put off for further discussion.—*Manchuria Daily News.*

South Manchuria Ry. Estimates.—According to the Japanese press reports, the South Manchuria Railway's estimates for the next Fiscal Year are put at about Y. 34,000,000 in capital expenditure. As may be imagined, every item is accompanied with good reasons, and the company's directorate has a hard nut to crack in cutting down the figures as some pruning must needs be made. Mr. Tsukuda, Director of the company, has been overhauling the figures with the assistance of the superintendents of the statistic and auditing and accounting Sections. Among the chief items are included the appropriations for extending the water-gas producer factory at Fushun, the initial outlays for establishing the Anshanchan Steel Works, the continuation of the Sand-Flushing process at the Fushun Collieries, etc. The allotment for the Dairen Harbour Works programme, consisting of the construction of the Third Wharf and the completion of the North-West Break Water, etc., is one which hardly admits of absolute suspension.

Speaking of the water gas producer factory, its extension should have been finished during the current fiscal year, according to the agreement with the Electro-Chemical Industry Co. The establishment of the Steel Works brooks no further delay in view of Japan's crying need for iron and steel. With regard to the sand-flushing process, when the funds required therefor and the coal-yielding capacity are taken into consideration, this process might be taken for a means to raise the cost of production; but without this installation almost the whole of the Collieries at Fushun would be thrown out of exploitation in twenty years with a vast coal still lying untouched. Moreover, by the introduction of this process the danger of gaseous explosions may be successfully precluded, and on this potent ground the appropriation for its continuation is asked for. As the Company's staff is steadily expanding with families of officials etc., the enlargement of housing and school accommodation has become a matter of imperious necessity. The Railway Company is said to be in a position to disburse not more than Y. 30,000,000, and it is conjectured that the figures will be fixed at about Y. 25,000,000 in capital expenditure.

S. Manchuria Locomotives for Indo-China.—Part of the order for railway locomotives, placed by the French Indo-Chinese Railways with the South Manchuria Railway workshops, Shahokou, was finished recently. Those completed were subjected to a trial run and the first consignment of the same was shipped to Saigon by the *Takaosan Maru*. This is the first order received from abroad and executed by the Workshop.

Japan's Railway Revenue Increase.—The revenue of the Imperial Japanese Government Railways from April to November 21 was 41,529,387 yen in passenger fares and 42,647,540 yen in freight charges. Compared with the same period of 1914, there was an increase of 3,676,134 yen in passenger fares and 8,769,781 yen in freight charges, and against the same period of 1915, an increase of 4,446,136 yen in passenger fares and 8,396,573 yen in freight charges, this year.

South Manchuria Ry.Earnings.—The total returns of the South Manchuria Railway for December, 1916, were 3,568,493 yen, of which 3,327,609 yen came from the main line and 240,814 yen on the Antung-Mukden Line. Camparing the total with that of the corresponding period of the previous year there is an increase of 640,896 yen. A comparison of some of the records of 1915 and 1916 follows:

	Dec., 1915	Dec., 1916
No. of passengers	318,809	372,923
	(tons)	(tons)
Freight carried	695,206	668,111
	yen	yen
Passenger trade	439,302	503,0 8
Freight ,,	2,291,210	2,587,124
Warehouse	17,985	24,725
Miscellaneous	124,749	147,382
Total	2,873,246	3,327,609
Average trade per day	92,685	107,342
Average trade per mile	134	205

The total returns for all departments from April 1 were 18,840,212 yen, which, when compared to the 16,190,127 yen for the same period of the previous year, is an increase of 2,493,763 yen.

The effect of the three-line transportation has not yet been ascertained and the results are watched with interest. This is a compromise reached by Imperial Railway Board, the South Manchuria Railway and the Chosen Railway to standardize the transportation rates from Japan to Antung. Up to the time of the compromise goods were shipped from Japan through the port of Dalny because rates were cheaper, most of the way being on water. while the Chosen route, though shorter, was higher due to the longer land transportation. In order to equalize the trade, a compromise was influenced by the Government. It is expected that due to the large amount of transportation, a monopoly by a single line is not possible nor is the bulk small for the two lines. This is proved by the congestion of commodities on all lines, and it is expected that the Manchuria Railway will enjoy about the same returns this year as last.

Kyoto-Osaka Tramway Fire.—A loss of 300,000 yen was suffered by the Kyoto-Osaka Electric Railway Company when fire broke out at the company's car barns at Fukakusa on January 16. The building, fifteen passenger cars and four freight cars were destroyed; they were fully insured.

SHIPPING

Half Century of Steam on Pacific.—On January 1 fifty years ago the American steamer Colorado left San Francisco on the first trip ever made by a steamship across the Pacific Ocean. The Colorado was a Pacific Mail side-wheeler, and had a registered tonnage of about 2,000 tons. Fifty years after its departure the entire American fleet in the Oriental trade consists of the steamer China, owned by Chinese, and three medium-sized steamers operated by the recently revamped Pacific Mail Company.

Shipping Competition on Sungari.—The shipping department of the Chinese Eastern Railway was until sometime ago enjoying brisk trade with its twenty-two vessels and forty trawlers on the Sungari River, but since the advent of another large Russian shipping concern keen rivalry has begun, causing losses to both. The Chinese Eastern Railway people, realizing the inadvisability of competition against their own nationals, have opened negotiations with the company upon the loan of steamers, according to Japanese press reports. The Railway people are taking the step from patriotic motives; they are looking toward the progress of Russian merchant marine. The negotiations, it is said, are being carried on satisfactorily and a compromise will be in effect when the waterway opens for trade next spring.

China Mail Orders 2 New Ships.—Aiming at the acquisition of a fleet of five vessels, instead of the one ship now in operation, Look Tin Eli, president of the China Mail Steamship Company, has arranged with the Wallace Shipyard of Vancouver, B. C., to deliver two ocean liners within ten months, according to statements in the Japanese press. Negotiations are also being made for the purchase of another vessel, while the steamer Nile, recently acquired by the company, will be placed in service as soon as it is released by the British government.

The China Mail Company was formed about a year ago, when the old Pacific Mail liner China was bought. Since the China has been on the run, under the United States flag, for the China Mail, she has been crowded to the gunwales with Chinese passengers and cargo on every trip. The success of the venture was such that Chinese capital rolled into the treasury of the company, which now has $10,000,000 in gold to spend on other ships. The prices for the two new steamers will be $1,500,000 each.

O. S. K. South American Line.—With the departure of the Kasado Maru from Yokohama for Rio de Janeiro and Buenos Ayres on December 17, the new South American line of the Osaka Shosen Kaisha was begun. The Kasado Maru was originally scheduled to leave Yokohama a week earlier but sailing was postponed on account of the large shipments from Kobe. Among Japanese goods which are in large demand are porcelains, lacquer ware, silk and cotton goods, hosiery, toys, fertilizer, lumber and beans. As Japan is to send 5,000 emmigrants to Brazil annually for the next four years, a demand for Japanese provisions will be created. The Kasado Maru is of 12,000 tons gross. Another ship of the same size will be put on the line later. Ports of call will be Yokohama, Kobe, Hongkong, Singapore, Durban, Cape Town, Buenos Ayres and Rio de Janeiro.

T. K. K. Buys Kobe Hotel.—The Oriental Hotel in Kobe, once one of the finest hotels in the Far East, has been acquired by the Toyo Kisen Kaisha. The consideration is stated to be between 600,000 and 700,000 yen. The hotel is a four story structure of brick and stone, and has such modern features as an elevator and roof garden.

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20 Japanese Steamers Sold.—Twenty steamers, with a total tonnage of 74,277 tons, were sold by Japanese ship-owners to fo eigners in 1916, according to an official i vestigation. Of these steamers, seven, wi an aggregate tonnage of 25,632, were sold the Norwegians; two, with a total tonnage of 7,747, to the English; and two others wi a tonnage of 5,990 to the Spanish. One sh of 3,515 tons was sold to Filipino interests.

New Seattle-Orient Line.—Arrang ments have been completed for a new line steamships between Seattle and the Orien With more than $5,000,000 worth of ship building both here and in Japan to be place in service next spring by the new company the Norwegian-American Line, the Seattle Oriental fleet will be swelled to about fort great carriers, operated by six lines. Officer for the ships building in Japan have arrive here and are awaiting transportation to thei new commands, four of which are being buil in Nippon yards. One ship, the Thorfried now in the Orient, will be commissioned for the new trade upon the arrival of officials of the Norwegian company at Yokohama. Two of the ships building in Japan are the Yindiggen and the Beseggen, named after twin peaks in Norway. They are of 5,100 tons each. These vessels are being constructed for the Jens Folkman interests. The Vagland, of 3,500 tons is on the way in Japan for the Wilhelmson Brothers of Bergen.

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13 Millions in Half Year for N.Y.K.—Announcement has been made that owing to its general prosperity the Nippon Yusen Kaisha netted profits amounting to 13,000,000 yen during the last six months, a gain of 4,000,000 yen over the previous six months. The company's dividend for the half year was fixed at 28 percent as against previous dividends of 20 percent although many stockholders wanted 30 percent.

Baron Kondo, president, presided at the meeting, which was attended by nearly all of the stockholders as well as representatives of the government, which gives the N. Y. K. a subsidy. Reporting on the remarkable trade the shipping company has enjoyed. Baron Kondo expressed the belief that the prosperity would continue for another six months.

Operating ninety-nine steamers of its own and ten under charter, all of them having an aggregate tonnage of 470,000 the N. Y. K. transported a cargo of approximately 2,470,000 tons and carried more than 137,000 passengers in the six months' period ending September 30. Net profits were 17,243,809.420 yen, but the total was brought to 24,273,347.281 yen by 7,029 537.855 yen forwarded from the previous half-year period. Other items in the report follow: Reserve fund, 862,190.471 yen; bonus to officials, 200,000 yen; amount to be divided on shares, 3,850,000 yen; special allowances to employees, 400,000 yen; to be forwarded to the next period, 18,961,156.810 yen.

O. S. K. Plans Increase of Capital.—The capital of the Osaka Shosen Kaisha will be raised from 24,750,000 yen to 50,000,000 yen, if the plans approved by the directors of the big shipping company, who met in Osaka are passed by the shareholders, at the semi-annual general meeting. The directors also agreed that a regular dividend of 10 per cent be declared for the half-year, and in addition a special dividend of 20 per cent, making a total for the semi-annual period of 30 per cent. The increase in the O. S. K's capital will make it the largest shipping concern in Japan as regards the size of its capital. According to the plan adopted by the directors, the company's shares will be increased to one million, which means that 505,000 new shares will be issued. Of this total 247,500 shares will be taken up by present shareholders, while the rest will be offered to the public.

Japan's Naval Program.—The expansion of Japan's navy is more urgent at the present time than the reduction of her national debt, said Mr. Kizaye Shoda, Minister of Finance, in discussing the new naval construction program before the representative members of the Houses of the Imperial Diet. Mr. Shoda was explaining his statement that beginning with the fiscal year of 1918-19 and continuing until the program was completed 20,000,000 yen of the 50.000,000 which the government has set aside for the annual redemption of the country's national debt would be used in the construction of warships. This is contradictory to the principle by which the present ministry increased the fund for reducing the national debt from 30.000,000 to 50.000.000 yen. Mr. Shoda added that the government does not intend to abandon the idea of removing Japan's debt as fast as possible. He said that even with the increased outlay for naval expenses, the 50,000,000 mark might be maintained with the natural increase in the country's revenue.

The new naval construction program calls for an appropriation of 260.641.793 yen. It is proposed to build three battleships of the super-dreadnought type, two battle-cruisers on the order of the Kongo, and several light cruisers, destroyers, auxiliary vessels and submarines in the seven fiscal years commencing with 1917-18. With the conclusion of this program the Japanese naval authorities will realize their idea of establishing eight battleships and four battle-cruisers as the unit of the nation's fleet.

The total appropriation of 260,641,793 yen will be expended as follows:

	yen.
1917-18	14,329.208
1918-19	23,193,838
1919-20	41,739,437
1920-21	51,310,696
1921-22	55.140,448
1922-23	24,933,859
1923-24	24,994,307

Japanese Lines in Sharp Competition.—As a result of ruinous methods of competition growing out of the rivalry between the Nippon Yusen Kaisha and the Osaka Shosen Kaisha, the Japanese government may take steps to regulate the policies of these two big shipping companies. It is feared that if the two companies continue their present tactics the foreign trade of Japan will suffer. Rivalry between the N.Y.K and O.S.K. while existing for some time, grew keenest when the latter organization started its line to Australia, a field in which the Nippon Yusen Kaisha had long enjoyed a monopoly. Since then both companies have frequently reduced their freight rates, causing them to suffer considerable losses in an attempt to gain the upper hand. The Nippon Yusen Kaisha commissioned several extra steamers when the O.S.K. inaugurated its new line, while the latter concern, with a large surplus of profits at its disposal, has assumed an attitude equally defiant. Following the declaration of the O.S.K. that it is ready to sacrifice half a million yen to establish its new line, the N.Y.K. has announced that it will not reserve cargo space for shippers who patronize its rival.

INDUSTRIAL

Oil Seeds of Hankow.—Of sesame seed 236,606,267 pounds were exported in 1915, which was a substantial increase over the 139,315,867 pounds exported in 1914. The sesame-seed crop was not much above the average, and while the price in China declined more than one-fourth during the year, owing to the abnormally high price prevailing in Europe, the demand was great, because the unprecedentedly high freight did not prohibit its exportation. The demand seems to have augmented during the year even more rapidly than the freight rates advanced.

This article formerly went to Germany. As that market is now closed to the direct trade, it is not certain where the demand originates, but no sesame seed is invoiced direct for the United States.

Wood oil constitutes about 15 per cent of the total export of Hankow to the United States. The demand for this article not only in the United States but in all parts of the world has been growing rapidly. According to the Maritime Customs returns the export of wood and nut oil from Hankow in 1915 amounted to 80,604,800 pounds, which was a decline of 13 per cent. as compared with the preceding year. The general run of wood oil during 1915 is said to have been below the average quality, owing to adulteration with cheaper oil, and this became a marked feature toward the end of the year. The new crop began to arrive in December, and the early shipments were unadulterated, but the high price offered too great a temptation for the dealers, who proceeded to adulterate it almost immediately after the arrivals began to appear.

The beans shipped from Hankow are black, green, and yellow of the soya-bean species. There are also white beans and broad, or horse, beans. Among the exports from Hankow during 1915 were 17,854.933 pounds of black beans, 21,026,267 pounds of green beans, and 104,436.933 pounds of yellow beans. The broad beans shipped amounted to 35,598,000 pounds. The beans of all kinds shipped in 1914 amounted to 298,813,600 pounds and those in 1915 to 190.038,533 pounds. No beans are shipped directly to the United States from Hankow, nor is it considered that this would be the most appropriate Chinese market for the purchase of any of these, unless it be the broad beans.

Bean cake is an article of great domestic importance. The quantity exported from Hankow in 1915 was 43.438,200 pounds in excess of the export in 1914, reaching a total of 297,652,133 pounds. Bean cake is not exported to the United States, as it is understood locally that it contains too high a percentage of oil to permit of its reaching America in a merchantable condition. The demand in China is considerable for use as fodder and as a fertilizer. Hankow is not a market of the greatest importance for this article, which comes more particularly from the north of China, whence it goes direct to other countries, chiefly Japan, although it is shipped also to the southern part of China to be used in the main as a fertilizer on the cane plantations.

A number of inquiries were received from the United States last year for groundnuts (peanuts), which have not heretofore been exported direct from Hankow to America, nor did the inquiries receive any considerable consideration by the local exporters. It seems that local firms formerly exported groundnut kernels to France, with a doubtful profit, and only a few firms were anxious to secure an American market for them. They are exported from Hankow in considerable quantities, but usually to other ports for transshipment to foreign countries.

The impression prevails that in order to satisfy purchasers beyond the seas local shippers should have technical knowledge which is not possessed generally by the local exporters. It was considered preferable to ship 111,503,733 pounds to Shanghai and southern ports rather than to ship direct to foreign countries. The exports in 1915 were twice as large as those of the preceding year.

Industries of Hankow.—The industries of this consular district are not varied nor are they, with a single exception, of any considerable magnitude. The Hanyang Iron & Steel Works, the largest Chinese undertaking in China, installed during 1915 one blast furnace with a daily capacity of 250 tons and plants for unloading ore, stone, pig iron, and steel to and from the wharves. Machinery is being provided for removing pig iron from the casting bed and pig breaking and No. 7 open-hearth furnace of 70 tons capacity has been practically completed, while in the dolomite mill four calcining cupolas and a grinder have been added. Another improvement of considerable importance was the installation of a water system drawing water from the Han River, for which the necessary settling beds and water channels were made.

This company had no labor trouble during the year. The output of pig iron consisted of 136,541 tons; of steel. 30.776 tons of rail and 16.624 tons of mild steel. This firm employed during the year 17 Chinese engineers, 3 foreign engineers, foreign chemist, and 7 foreign foremen, with a general staff of 252 persons, 2,000 workmen, and 2,500 laborers. The Government arsenal and powder factory also are located at Hanyang.

The Yangtze Engineering Works is rather a new concern, having been established in 1908. It is purely Chinese and under Chinese management. Its registered capital is 500,000 taels ($306.000), but owing to the increased business it has been increased to 1,000.000 taels. This plant claims to be capable of undertaking all classes of engineering work, and among its various undertakings during 1915 was the erection of bridges for the Hankow-Ichang Railway on a bid of $77,103. Other work undertaken was the building of small river gunboats for the Chinese Government, railway and mine cars, boilers, girders, water tanks and towers, tugboats, launches, motor boats, lighters, pontoons, and repair work. The firm states that its business this year has been good. It is probably as useful an institution for the development of engineering industries as any in Hankow.

This is declared by the U. S. Consul General to be an opportune moment for the establishment of an American firm to handle railway equipment and supplies, flour-mill machinery, structural metals, engineers' supplies, and mining equipment. Paper-making machinery should be included, as there are a number of Chinese plants with primitive methods turning out a cheap paper, and there is every reason to think that a qualified representative would be able to convert many of these antiquated plants into small modern ones with equipment able to multiply many times their output.

The Chinese Government Paper Mill has concluded its first year's work and produced about 100,000 reams of paper. The paper manufactured comprises news paper, ordinary printing paper, various kinds of colored paper, wrapping paper, and cover paper. The machinery is of the first quality, but probably inadequate to meet the demands of a fully equipped plant. The materials used for making various kinds of paper are wood pulp, rags, and straw in large quantities.

A cotton mill is located in Wuchang which is capable of producing yarn and threads to No. 20, and which has had a successful year. Toward the close of the year a contract was entered into by some Chinese gentlemen for the erection of a second mill, which will probably be in the list of important industrial developments for the current year.

New Companies at Chefoo.—The new companies organized during 1915 include the following:

Match factory.—Capital, about $100,000 Mexican; machinery and material (wood, boxes, etc.) imported from Japan; matches were placed on the market in 1916.

Clock and watch manufacturing company.—Capital, about $100,000 Mexican; material in parts imported from Japan and assembled locally.

Umbrella company.—Capital, about $20,000 Mexican; materials made locally.

Rug and carpet company.—The Chefoo Rug & Carpet Co. toward the end of the year began the manufacture of rugs and carpets similar to those made in Tientsin and Peking. Present capital, about $5,000 Mexican.

AVIATION

Japan Buys Aero Motors for Russia.—Through the New York office of Mitsui & Co., the Russian Government has placed a huge order for aeroplane motors. These motors are being built by the Hall-Scott Motor Company in Berkeley, California. M. Yasumoto, a young Japanese engineer attached to the New York office of the Mitsui Company, quietly came to San Francisco several weeks ago, tested the Hall-Scott motors, gave them a technical verdict, and is now supervising their construction, at the rate of about two a day.

It is understood that the Russian Government is paying approximately $1,500 apiece for the engines and that the contract totals several hundred thousand dollars. The motors are shipped as fast as they are completed, the planes being built in Russia. They are 125 horse-power, the largest aeroplane motors now practicable.

Yasumoto admitted that the contract was a large one, but refused to give the exact amount. It was learned that the placing of the order followed an unsuccessful attempt of the United States Government to procure a 400 horse-power motor for six huge, double engine planes. Silas Christofferson and other aeroplane builders were consulted in this quest, but none could deliver the motor.

Japanese Aviators in China.—Four Japanese aviators are now engaged to instruct the Chinese to fly at Tsingtao. They are aviators Sakamoto, Hoshino, Kumagi and Tachibana. Of the four, Sakamoto and Hoshino are wearing the uniform of Major-General and the other two that of Colonel.

Every day they are giving instructions to the Chinese students, but as the aeroplanes they brought from Japan are not set up yet, they are only teaching their students the primary construction of aeroplanes.

Two aeroplanes are at the aviation field ready to be set up, and it is expected that the three machines of Mr. Y. Ozaki will soon reach Tsingtao.

Japan's Aviation Programme.—Japanese Military Aeronautics Investigation Commission which succeeded in the construction of aeroplane-destroyers and armoured aeroplanes has under scheme the construction of a huge aeroplane with accommodation for a crew of eight. Another plan for the construction of an armoured airship together with the establishment of the Military Aerodrome No. 2 is also under way. The armoured airship will be modelled after Zeppelin airships with a length of 130 feet and a capacity of 20,000 cubic metres for its balloon, and will be equipped with four 300 H. P. motors capable of continuing an aerial cruise for 30 hours at a speed of 20 metres per second, with a crew of 20 and 200 *kuan* (1,666 lbs) of explosive. The new airship is to possess double the fighting power of the *Yuhi*. As previously reported, the new aerodrome is to be laid out in Kagamigahara (Gifu Prefecture). A hangar and an aircraft building yard will be reared. The surveys of the proposed site have already been finished. Owing to the financial consideration, the completion of the whole work in the coming fiscal year is thought doubtful.

RUBBER

Kiungchow Exporting Rubber.—The first exportation of rubber started during the summer of 1915. Trees were introduced from Singapore into the island during 1910 by the two Chinese companies Kiung An and Chiao Hsing. 4,000 rubber trees were planted in an area of 100 mou by the Kiung An Co., in Chiachi, in the district of Kiungtung. Tapping of trees commenced in April. At present rubber can be produced from only 2,000 trees, which produce 5 catties of rubber a day. From June to the end of the year 3 piculs were sent away to Singapore, where it was found to be of first quality, but sold as second quality, at the rate of $100 per picul, as the rubber was not properly prepared. With a view to improving the rubber the company will purchase machinery for its better manufacture. 12,000 trees are also in cultivation by the Chiao Hsing Company in an area of 300 mou near Nodoa, in the Tanchow district, but the trees are still young and not expected to produce rubber for another two years.

Rubber in Cochin-China.—Although only as yet in its infancy, there seems some prospect that rubber planting will eventually develop into an important industry in the French possessions in the East Indies. A report specially drawn up for the exhibition at Taiwan, Formosa, entitled "Annales des Planteurs de Caoutchouc de l'Indo-Chine" gives some interesting details regarding the progress which is being made.

At present planting has been confined mainly to Cochin-China, and there are only about five million Hevea trees planted, the total output in 1915 being 256,342 kilos, or about 564,000 pounds, a fact which shows what a comparatively small proportion of the trees is as yet in bearing. The whole industry, indeed, seems to have started from the example of one colonist, a certain M. Belland, who, with a small plantation of about 15,000 trees, succeeded in the second year of tapping—at the time of the rubber boom—in making a net profit of £4,000. Two companies were subsequently formed in 1907 and 1908, and the Government has also carried out experimental planting at its agricultural station at Ong-Yem.

There are, however, no plantations as yet on the scale to which we are accustomed in the Malay Peninsula, most of the trees being planted by small colonists, who hope to achieve the same success as M. Belland. The country, it is stated, is suitable to the Hevea Braziliensis, and while the growth is rather slower than in the Malay Peninsula the trees are more free from disease. About six plantations are now in bearing, but only three are of any importance. The original Belland plantations have now an output of 61,600 pounds, the Société des Plantations d'Heveas de Xa-trach one of 282,900 pounds and the Société Agricole de Suzannah produced 200,000 pounds last year. Others will come into the field before long, but it will be a good many years before the exports of rubber from Saigon become an important factor.

Rubber Exports.—Following is a comparative statement of cultivated rubber exported during January to July inclusive for the years 1916 and 1915 from the Federated Malay States.

	1915 Tons.	1916 Tons.
Straits Settlements ...	23,345.10	14,969.29
United Kingdom	7,613.03	7,401.81
Continent of Europe ...	...	8.00
Ceylon ...	408.60	402.85
Other Countries	778.15	95.07
Total ...	32,144.88	22,877.02

The export from Malacca from January 1st to 30th June was 3,442,134 lbs.

The export 1915 for the same period was 4,329,778 lbs. and 1914 2,548,819 lbs.

Export from Ceylon, January 1st to July 10th, 1916, were:—

	Lbs.
To United Kingdom ...	9,986,047
,, America ...	13,386,810
,, Australia ...	489,231
,, Continent ...	1,103,194
,, Japan ...	155,189
,, India ...	678
Total ...	25,121,149
For the same period, 1915 ...	20,647,982
,, ,, 1914 ...	14,511,747
,, ,, 1913 ...	10,417,925

Rubber Cultivation in Hainan.—The first export of rubber from the Island of Hainan started during 1915. Trees were introduced into the island in 1910 by two Chinese companies. There are 4,000 in the Lo Hui district, 2,000 of which began to be tapped in April, 1915. About 4 hundredweight of rubber was sent to Singapore between June and the end of 1915, and realised about £7 10s. 6d. a cwt. The rubber was of first quality, but faultily prepared, and sold only as second quality; machinery being required for its better preparation. There are 12,000 trees in cultivation near Modoa, but they are still young and not expected to produce rubber for another two years.

WIRELESS

Wireless in Formosa.—A Wireless Station for the use of the Imperial Japanese Navy will be installed near Hozan, South Formosa and operations are being commenced, by an expert sent there from Osaka. The new station, which is expected to be completed by 1918, will be built entirely by Japanese, on Japanese plans.

MANUFACTURES

Japan Now Exports Chemicals.—The Department of Agriculture and Commerce adopted in the early stages of war a policy of absolutely prohibiting the export of chemical drugs, but later changed the policy and allowed the export of some of the drugs, the production which is more than sufficient for home demand and can be sold in foreign markets with profit. In the latter half of the past year a considerable quantity of chemical drugs has been exported and the amount is still increasing. The principal drugs for export are yellow phosphorus, hydrochlorate of potassium, caustic soda, chlorate of potassium. Of these hydrochlorate of potassium was turned over by only three companies, but now it is produced in 34 places, the annual production amounting to 3,500 tons. The production is now far in excess of home demand. The price has now somewhat fallen to about 100 yen. This price, however, is about five times as high as the pre-war mark. At this fair price, it is briskly in demand in Russia and China, and the Government is taking steps to promote the export.

The Government, however, is still prohibiting the export of dye-stuffs, in spite of the fact that the production is a little in excess of home demand. The reason for this seems to be that the home made dyes are still inferior in quality, and such a supply of inferior goods would hurt Japan's reputation. The Government is also prohibiting the export of caustic soda for the present because the export would result in raising the price in the home market and would do harm to various industries. But the Government is inclined to allow its export within certain limitation. It may be remarked, by the way, that no imported drugs will be allowed to be re-exported, except those whose import is carried on without interruption.